THE

GEOGRAPHICAL MAGAZINE.

MAY, 1876.

THE ARCTIC EXPEDITION.

VII.

Prospects for the Campaign of 1876.

We now enter upon the month in which the Arctic Expedition sailed from England last year amid the hearty cheers of a vast concourse of people, and the good wishes of the whole country. We already know the history of the voyage out to Greenland, of the stay at Godhavn and the parting with the 'Valorous,' and the fortunate passage through the middle pack to the Cary Islands, where there was every sign of open water to the northward. The last letters, brought home by Captain Allen Young from the cairn on the S.E. Cary Island, are dated on the 26th of July. Those letters were full of bright hopes, and of apparently well-founded anticipations that there would be much open water up Smith Sound. There was an extraordinary absence of floe ice round the Cary Islands, and it was hoped that the unusual prevalence of north winds would have carried the ice out of the strait leading towards the Pole. On the 26th the temperature of the sea was so high as 40° Fahr. during the afternoon, an indication that there was no ice in the vicinity of the ships; while there were nearly six weeks of the navigable season remaining.

It is now nine months since any tidings have come—and many more anxious and weary months are before us, ere we can hope for news from the gallant explorers. But in the light of knowledge derived from the work of former expeditions we can follow them in imagination; and there are many anxious ones whose thoughts will very constantly be in the far north during the long and dreary interval of silence. It will, perhaps, be the wisest course not to raise our hopes too high. True all the indications, on July 26th, were in favour of the attainment of a very high northern latitude; but those who know the Arctic Regions will place but little faith in such signs. On one day there is often an open sea, without a speck of white, and a water sky all round the horizon. On the next all is ice, and there is no water visible from the crow's nest. The ships may have been stopped in Kennedy or Robeson Channel, or they may have been able to carry out the original intention, the 'Discovery' being stationed in 82° and the 'Alert' being advanced far to the north. The only certainty is that all that human skill, forethought, and pluck can effect will be done. All else must be conjecture until news arrives. We cannot be certain of a favourable season, or of the nature of the unknown region. But we are certain that the officers and men who have crossed its threshold will strain every nerve to secure success.

The winter is now over. The long period of enforced inaction has at length come to an end; and here again the hope that that trying time has been one of healthful recreation and useful work, may be looked upon virtually as a certainty. The officers have all the qualifications for organizing a successful Arctic winter, and the men are full of zeal, and anxious to follow the lead of those who are so well able to guide them. All are good men and true; and we firmly believe that they came out of the ordeal better in health and strength, more firmly knit and braced for the desperate attempt in the spring, and with a fuller knowledge of the value of the work to be done, than when the darkness closed in upon them last November. We may feel quite sure that the winter was a busy, a useful, and a happy time. Two wild and cheerless spots were filled with human interest. Many of the most fruitful results of the expedition were worked out in winter quarters. In the observatories the meteorological, magnetic, and pendulum observations have been taken, and the spectroscope will also have been in use. But it must be borne in mind that these investigations will be carried on under extreme disadvantages. It is no easy matter to take observations in such a temperature. To touch a clamp screw with the naked hands at a temperature of − 40° entails exactly the same consequences as are produced by grasping a red-hot iron bar; while the slightest wind makes a visit to the observatory not only a painful, but even a dangerous service.

During the month of March most active preparations will have been made for the spring travelling. The crews will have been selected, the officers will have weighed all the constant weights with extreme care, and packed the sledges, and every day there will have been exercise in sledge-dragging, with the different flags and other cognizances streaming in the icy breeze. This will have been a period of great interest for both officers and men. At length, in the very first days of April, the most stirring moment of all arrived. The sledges were assembled outside the ships, the men buckled to the drag-ropes, the officers took the lead, and, with three hearty cheers from those who remained on board, the explorers started on their desperate but glorious errand. At this moment they are exposed to all the rigours of an Arctic climate, with nights of hard toil, and days of

extreme cold and misery in the tents. That they will deserve success we know, and many are the prayers that are now offered up for their safety. But the undertaking is one of extreme difficulty and uncertainty, and we can only hope for the best. Full accounts will be found of all the details of Arctic sledge-travelling in two articles in our numbers for March 1875, p. 65, and November 1875, p. 330. These articles should be re-perused by those who wish to follow our brave countrymen in imagination, during the months of their heroic struggle against almost overwhelming odds.

For be it well understood, that the difficulties and risks are as great now as they ever were; and, in justice to the absent explorers, any statements which tend to detract from those difficulties should be contradicted wherever they are made. One such assertion, which certainly has a tendency to make their work appear less hard, is that the Arctic Expedition of 1875-6 has been better supplied and better fitted out than any previous one. This statement has often been made, but it is utterly untrue. Except as regards the advantage of steam power being in the vessels themselves, instead of in steam tenders, the 'Alert' and 'Discovery' are no better supplied than were former Arctic ships; while in one important respect they are not so well provided. The provisions are identical, the clothing is identical, the sledge equipments are identical. But the present ships are not so well fitted for an Arctic winter. In the 'Assistance' and 'Resolute,' in 1850-51, there were warming apparatus with hot air passing round the ship's side, and warming the cabins and lower deck. The stove was in a space below the deck on which the people lived, and this space was the drying room for washed clothes, the bath room, and the brewery. The great benefit of this arrangement, and the increased comfort derived from it, were fully exemplified in Captain Austin's expedition, as well as in the 'Resolute' under Captain Kellett.* In the 'Alert' and 'Discovery' there is no such arrangement, and consequently the discomforts of an Arctic winter will have been much more severely felt. In one other respect, namely, in number of men, the expedition of 1875 is much weaker than its predecessors. The 'Resolute' and 'Assistance,' with their tenders, had 180 effective men. The 'Alert' and 'Discovery' have barely 120. The present expedition has been well supplied and fitted out, but in no respect better than was the case in former expeditions, while the warming and ventilation is not so good; and the effective force for exploring is one-third less.

But no expedition ever sailed with a better set of officers and men. In this lies our main assurance that all will be done that is humanly possible, and that the results of the expedition will, under any circumstances, be most valuable. We trust that success will attend on their efforts during the present season, and that, after having completed a full measure of discovery, the expedition will return next autumn, having escaped all the dangers of Arctic navigation.

At the same time we must be prepared for the necessity of a second winter and a second season of sledge travelling; and we must not ignore the possibility of casualties. Against such chances the precautions ought to have been taken which experience has proved to be necessary. The most obvious precaution is to station a depôt ship within easy reach of annual communication with England; as the 'North Star' was placed at Beechey Island for the expedition of 1852-54, and the 'Plover' at Point Barrow. For the same reasons a depôt ship should have been stationed at the entrance of Smith Sound. The necessity for this arrangement has been constantly urged by those who advocated the renewal of Arctic exploration, ever since 1865. But the measure has not been adopted. Yet, in the event of any casualty, or of a second season, such a precaution is indispensable.

If one of the exploring vessels was lost, all hands would be crowded on board one ship, and the provisions would soon run short. If a depôt ship was at the entrance of Smith Sound, the men of the lost ship would be sent down to her, and she would go home with them, returning in the ensuing season. With no depôt ship the expedition would be at an end after such a casualty. In case of a second winter all invalids would previously be sent down to the depôt ship for a passage home.* With no depôt ship it is likely that their lives will be sacrificed. The precaution of stationing such a vessel at the entrance of Smith Sound is not, however, to be taken until 1877, when it will be too late for the objects stated above. In this respect the present expedition has not been so well cared for as that of 1852-54. The omission cannot now be remedied, and we can only most earnestly trust that the casualties will not have occurred which would make the presence of a depôt ship, before 1877, an absolute necessity. But an allusion to this precaution, the adoption of which is one of the canons of Arctic exploration, is desirable, because its necessity cannot be too strongly impressed upon those who advocate such enterprises; especially as, on the return of the present expedition, we hope that another will be despatched by way of Behring Strait.

Annual communication between England and the expedition is a further precaution which should not be neglected. It was taken in the case of the expedition of 1852-54, and cannot now be dispensed with; although, in the absence of a depôt ship as a safe rendezvous, it may be found impossible to secure all the advantages of despatching a vessel to communicate in the navigable season. Some of them, however, will certainly be thus secured. It is contemplated by the Admiralty that the exploring ships may be finally separated by the ice, and that the 'Alert' may be drifted away towards the east coast of Greenland. Sir George Back looks upon this contingency as being far from impossible. We pointed out, in our January number, that if this happens it will be a matter of life and death that the fact should be known in England by the autumn of this year. For this object alone the despatch of a vessel to Smith Sound in 1876 is a duty. If there is to be a second winter it is of the utmost importance that an effort should be made to convey letters and news to the men who have to remain out and face it. The moral effect of sending a vessel to communicate will, from this point of view, be incalculable.

Yet, when the expedition sailed, no arrangement

* See McDougall's *Voyage of the 'Resolute,'* p. 133.

* See our number for January 1876, p. 1.

had been made for communication in 1876. But Captain Nares has since, with wise forethought and sound judgment, taken on his side those steps which experience and former precedents have proved to be necessary. He has reported that one party from the 'Discovery' will communicate with Littleton Island or the cairn near Cape Isabella, arriving at the entrance of Smith Sound on about the 1st of May, 1876. In his instructions to the captain of the 'Discovery,' he left it to that officer's discretion whether he would send a second party to the entrance of Smith Sound in the autumn of 1876 for letters from home. If the summer of 1876 is an open one, it is pointed out that the vessel which is expected to come out may reach Cape Sabine, or even Cape Prescott in Smith Sound. It is anticipated that it will be easy work to go south in a boat, but not so easy to return north while the young ice is forming.

These arrangements prove that it is considered necessary that there should be communication with England in 1876; and they of course make it more indispensable than ever that a vessel should proceed to the entrance of Smith Sound. We have already announced that the Admiralty have secured the services of Captain Allen Young,* and he will sail again in the 'Pandora' on the 25th of May. Lieutenant Arbuthnot, R.N., will accompany him, and his other officers are Lieutenant Koolemans Beynen, of the Dutch navy, and Navigating sub-Lieutenant Pirie; accomplished, intelligent, and zealous young officers, who have already acquired experience in ice navigation during the interesting cruise of the 'Pandora' last year. The task which has thus been entrusted to Captain Allen Young is by no means an easy one; and it may prove to be a service of great difficulty and danger. The thanks of the whole nation are, therefore, due to him for consenting to undertake it. The warm and heartfelt gratitude of the relations and friends of the absent explorers he already has; and they all feel implicit reliance on his seamanlike skill, and on his judgment as an experienced Arctic navigator, qualities which will be much needed. He will have to examine Littleton Island, Cape Isabella and Point Gale, and at one or other of these stations he will certainly find notices and letters deposited in July 1875; and also the letters which will have been brought down in May 1876 from the 'Discovery.' These will give full information of the progress of the expedition during the navigating season of 1875, and respecting the positions of the winter quarters. They will also furnish tidings of any casualty, and the conveyance of such news to England forms one of the reasons which render annual communication so important. Probably also a boat will be sent down with further letters in the autumn, and to bring back letters for the expedition, news which will be most anxiously looked for by men who will have had no syllable of tidings from their friends—no word from home for upwards of fifteen months.

Possibly the 'Pandora' may meet the 'Alert' and 'Discovery' coming out of Smith Sound with their work done, their great enterprise completed. While prepared to hear that a second winter will be necessary, we earnestly hope that this autumn will see our dear friends at home once more, and receiving a welcome from their countrymen, after all the dangers and sufferings of Arctic service, as hearty as was the God-speed with which they were greeted on their departure.

* See our numbers for January, p. 3, and for March, p. 77.

SOKOTRA.*

THE Island of Sokotra became known to the ancients at an early date. The author of the Periplus of the Erythrean Sea describes it as a desolate island, having but few inhabitants, most of them residing on the north side. The population, even then, was a curious mixture, for amongst it were to be found Arabs, Indians, and Greeks, and they traded with Muza (Mokha) and the west coast of India. The island at this date was subject to the kings of the incense country (Hadhramaut), whose capital was at Sabbatha. Ptolemy likewise refers to the island. It was known to the ancients under the name of Dioscorida, which has been derived from the Sanscrit, Dvipa Sakhádhára, *i.e.* island of the abode of bliss, but may be a corruption of some native name.† Huet‡ proposes Diu (island) Socotora, and A. Sprengel§ suggests that its name may have been derived from Kâtir, the old Arab name for dragon's-blood, one of the principal products of the island. Cosmas, who wrote in the 6th century, as well as Edrisi, and others amongst the early Arab geographers, state that Alexander the Great, on the advice of Aristotle, established an Ionian colony on the island, to cultivate the aloe, that these Greeks subsequently were converted to Christianity, and were joined in the time of the Ptolemies by others of their countrymen, with whom they were still able to converse. Ibn el Hayik Hamdamy,‖ in his description of Arabia, says that representatives of all the tribes of the Mahra were to be found on the island, which, on their first arrival, they found in the possession of Byzantine Christians, who had been cast upon it. He estimates the number of men capable of bearing arms at 10,000. Colonel Yule relegates all these stories of a Greek or Byzantine colony into the region of fable.¶ Marco Polo, though he did not visit the island, furnishes a description of it. The inhabitants in his time (13th century) were Christians, and had an archbishop at their head. They traded in ambergris, salt fish, and cotton stuffs, and enjoyed the reputation of being the best enchanters in the world, being able to raise the wind as they listed, to confound their enemies. Nicolo Conti, the Italian traveller, stayed some time on the island in the first half of the 15th century, and confirmed the fact of its inhabitants being Nestorian

* The fullest account of Sokotra is that furnished by Wellsted (*Journal Royal Geographical Society*) vol. v. 1835. He is the only European who has explored the interior, and it is to be regretted that his published map should fall so short of what we might fairly expect. The Admiralty chart is based upon surveys conducted in 1834-5 by Captain Haines. For a general description of the island, see also Guillain, *Documents sur l'Afrique Orientale*, Paris (no date); Heuglin, in the *Mittheilungen* for 1861, and M. H. Capitaine in *l'Explorateur*, vol. iii. p. 265; *Transactions Bombay Geographical Society*, vols. vi., vii., xv.

† On this, as well as on many other historical questions connected with Sokotra, see Yule's edition of *Marco Polo*.

‡ *Histoire du commerce des anciens*, 1855.

§ *Alte Geographie Arabiens*, Bern, 1875, p. 88.

‖ Sprengel, *Arabien*, p. 89.

¶ *Marco Polo*, ii. p. 343.

Christians, as did also Ludovico de Barthema,* about 1506. In the meantime the Portuguese had discovered the passage round the Cape, and were gradually finding their way to the East Indies. Vasco da Gama, in 1497, passed close to the island without discovering it, and it was reserved for Diego Fernandez Pereira to make its existence known to European navigators. This was in 1503. Three years afterwards the island was captured by the fleet under Tristan da Cunha and Albuquerque.†

The Portuguese vessels cast anchor in front of Zoko, the capital of the island at that time.‡ The first who lept on shore was Alfonso da Noronha, with a few brave men. The Arab Sheikh, with eighty men made a gallant defence, but was killed and his fort taken. The natives, who were Christians, came to thank Da Cunha for delivering them from the heavy yoke of the Moors. They were received under the protection of the King of Portugal, and Alfonso da Noronha was chosen to command the fort which the Portuguese built, and of which traces still exist.§ The island at that time was subject to the Sheikh of the Mahra, who resided at Keshin, on the opposite shore of Arabia. All the inhabitants, with the exception of the alien Moors were Jacobite Christians, "like the Abyssins."‖ The men were named after the apostles, the women after the Virgin Mary.¶ They worshipped the cross, which they set up in their churches, and wore on their clothes. Service was held three times a day, when the prayers were read in the Chaldean (Syrian) language.

The Portuguese evacuated the island after a stay of only four years, and it then reverted to its former owner, the Sheikh of Keshin, and has been held by him up to the beginning of the present year, excepting temporary occupations of the island by the Turks (1538), by the Wahhabis, who destroyed Suk in 1800, and by the English. Estevan da Gama when he proceeded from Goa to the Red Sea, in 1541, to destroy the Turkish galleys, called at the island, and we learn from the historian of this expedition, João de Castro,** that the inhabitants were still Christians, and acknowledged neither king governor nor prelate. In the latter respect this casual visitor was undoubtedly mistaken, although the authority exercised by the Sheikh of the Mahra appears at no time to have been very exacting. Francis Xavier, who visited Sokotra about the same period—he started from Europe for the East in 1541, and died in 1552 on the road to Goa—still found Christian churches. The people reverenced the cross, placed it on the altar and wore it round their necks, and the kashis (presbyters) repeated the prayers in a forgotten tongue.

* See Badger's edition, published by the Hakluyt Society.

† Faria y Souza, *Asia;* Barros, *Decadas da Asia.*

‡ The modern Suk, close to Tamarida, the present capital.

§ A full account of these transactions will be found in the commentaries of the Great Albuquerque, a volume recently translated and edited by Mr. Birch for the Hakluyt Society.

‖ Dr. Badger supposes the Sokotrans to have originally been Nestorians, who subsequently embraced the Monophysite doctrines of Jacob Baradœus, whose followers were styled after him Jacobites. In that case Da Souza is correct in classing them with the Abyssinians.

¶ M'ra, mr'ia, is the Arabic for females.

** His account was taken in a Portuguese ship, purchased by Sir W. Raleigh, and published by Purchas. See also Astley, i. p. 104.

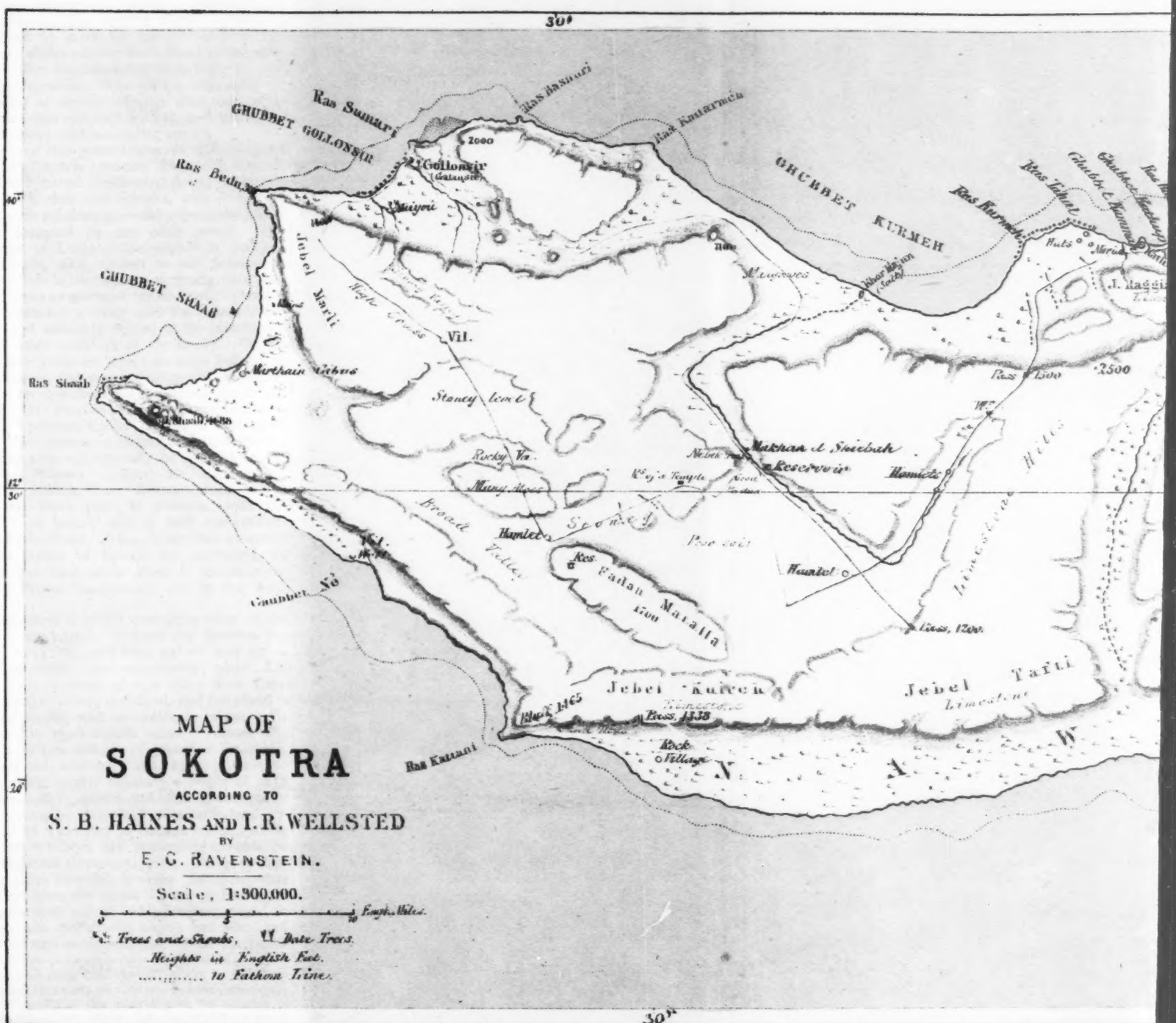
At the commencement of the 17th century, ships of the East India Company frequently called at Sokotra, where they met with an hospitable reception, and bought the aloe collected by the governor.* W. Finck, in 1607, found the island in possession of the Sheikh of Keshin, and he saw a church with a cross on the top of it. The merchandize consisted of aloes, dragon's-blood, dates, and black ambergris. In 1610 the Arab governor gave a hearty welcome to Sir Henry Middleton, who commanded the East India Company's fleet, and in 1611 Captain Saris received "very friendly entertainment." The Jacobite Christians are stated to have lived then in a state of bondage. In 1612 Thomas Roe, on his route to the court of the great Mogul, called at Sokotra, and was given "very friendly entertainment." He still saw a church there, near Tamarida, which contained images and an altar surmounted by a cross. Soon after this the visit of Europeans became less frequent. The last amongst them who found traces of Christianity was P. Vincenzo, a Carmelite monk, whom Pope Alexander VII. sent to the East in 1656. He found churches with crosses, but the Christian doctrine had become a strange jumble of all sorts of rites, including sacrifices to the moon and circumcision. Wine and pork were held in abhorrence. About 100 years afterwards Ovington visited the island, but says nothing about Christians; and Wellsted, who traversed it in all directions in 1834, failed to discover any traces of Christian churches. He discovered, however, some rude sculptures, on a flat rock of limestone, representing crosses, figures with snakes' heads, and the footmarks of animals, besides inscriptions similar in character to those previously discovered by him in Hadhramaut.

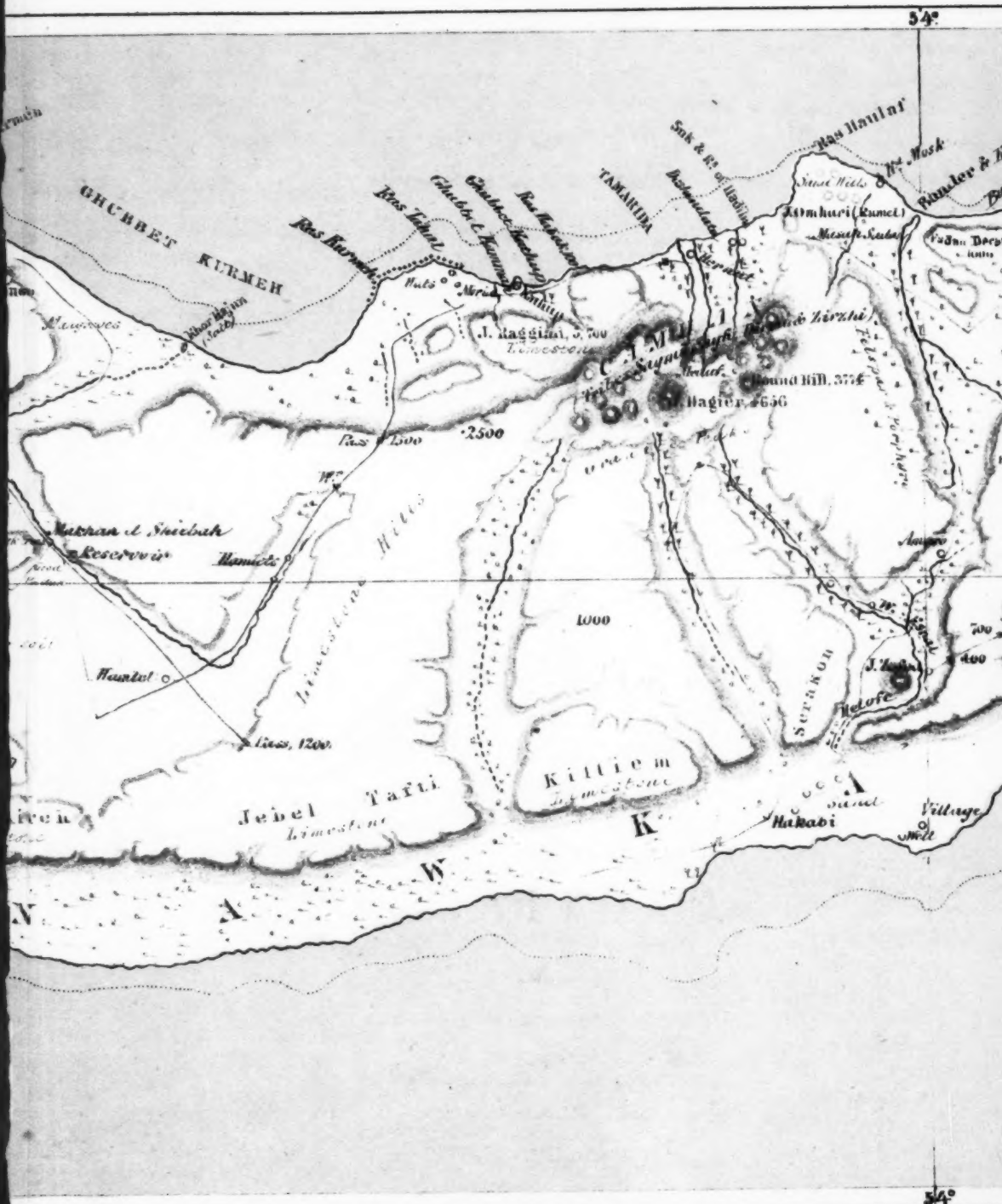
In 1800, when the French were in Egypt, Admiral Blanket was authorized to take possession of the island, but does not appear to have done so.

In 1834 it appeared desirable to the Indian Government to secure a coaling station on the route between Suez and India. The island of Sokotra appeared to answer the purpose, and Captain Haines was sent there in the 'Palinurus' to examine the coast with a view to the discovery of a well-sheltered harbour. Lieutenant Wellsted in the meantime explored the interior of the island. The examination appears to have proved satisfactory, but Am'r ibn Tawâri, the then ruling Sheikh of Keshin resolutely refused to entertain proposals for selling the island declaring that, "As sure as there is but one God, and he is in heaven, I will not sell *so* much," making a span with his fingers. "It was the gift of the Almighty to the Mahras,† and has descended from our forefathers to their children over whom I am Sultan." The Sheikh was as courteous as he was firm, and when Captain Haines took his leave, he said, "God in heaven is my witness, we have both

* Accounts of these voyages are to be found in Purchas. The original journals are in the India Office, and a calendar of them is about to be printed by the Hakluyt Society.

† The Mahra tribe inhabit the south-eastern coast of Arabia from Misenat to Ras Nus. The Sultans of Keshin have, for many generations been the sovereigns of the Mahra tribe, and all the lesser chiefs acknowledge their sovereignity. The territory of the Mahras is a strip of land bounded on one side by the sea and on the other by the mountains of Subhan. They have about sixty trading boats of from 15 to 100 tons.


30°
Ras Suwaf
GHUBBET GOLLONSIR
Ras Bedus
Gollonsir
2000
Ras Kuarmeh
GHUBBET KURMEH
Ras Kurmeh
Ras Tahut
Ghubbet Haushayer
Ghubbet Kurmeh
Huts
Meriut
GHUBBET SHAAB
Jebel Marli
Vil.
Ras Shaab
Merthain Tobus
Stoney Level
Rocky Va.
Hamlets
Broad Valley
Ghubbet Se
Fadan Matalla
1700
Pass, 1700
Jebel Kuren
Limestone
Pass, 1338
Jebel Tarfi
Limestone
Rock Village
Ras Kataani
MAP OF
SOKOTRA
ACCORDING TO
S. B. HAINES AND I. R. WELLSTED
BY
E. G. RAVENSTEIN.
Scale, 1:300,000.
English Miles.
Trees and Shrubs. Date Trees.
Heights in English Feet.
..... 10 Fathom Line.
30°


54°
GHUBBET KURMEH
Ras Kurmeh
Ras Tahuni
Ras Hafoudah
TAMARUDA
Ras Haulaf
Mt. Mask
Kumhuri (Kumet)
Masuja Sultan
Mt. Jaggiral, 3,700
Limestone
Mt. Sagier, 3656
Round Hill, 3774
Pass 2500
Makran el Sheibah
Reservoir
Hamadi
Limestone Hills
1000
Haultal
Pass, 1200
Jebel Tarfi
Limestone
Kittiem
Limestone
Hakabi
Village
Well
Sebakoh
Relofe
700
400
54°

Bahi Rahan
Ras Dom, 250
Ras Edresseh
Bander Fikeh (Thleiv)
Bander Ricesseh
Ras Felisk
Tamerah
Klayef
Thaereh
Ras Hammadareh
Bander & Khor Gwiah
Bander & Khor Dehi
Ras Dehammeri
Bander Ikteni
Jun. Deraboun
Ras Ikteni
Ras Mohammed
Pass, 1700
Pass, 1700
Jebel Shaikh Zamesteat
Jebel Shaikh
Jebel Shaikh
Jebel Shaikh

endeavoured to fulfil our duties; you to your Government, I to my tribe, as their father. Farewell!"*

The Indian Government, however, determined to occupy the island. The rightful owner of Sokotra having declined to surrender his claims, they despatched some native infantry from Bombay and took possession.† The English occupation, however, was only of short duration. The troops, consisting of two companies of native infantry, were soon withdrawn, as Aden was captured in 1839, and was found to be a much more suitable coaling station.

In January of the present year H.M.S. 'Briton,' commanded by Captain Lindesay Brine, with General Schneider, the Political Resident at Aden, on board, proceeded to Keshin and Sokotra, with a view to establishing such relations as would prevent the island from being occupied by any other power. The present Sultan of Keshin is the nephew of that old Am'r ibn Tawâri, who refused to sell Sokotra in 1834, and the heir is his nephew, a young man who resides at Sokotra as governor for his uncle. General Schneider negotiated a treaty with the Sultan, which was signed and solemnly agreed to by himself, his heir and the other members of the family. On his side the Sultan promised never to cede Sokotra to any foreign power, and never to allow any settlement to be made on it without the consent of the British Government. He thus, as regards Sokotra, became a feudatory, in a position similar to that of the Sultan of Láhej.‡ He received a payment of 1000 dollars, and a smaller sum will annually be granted to the Governor at Sokotra. After the signature of this treaty at Keshin, the 'Briton' proceeded to Tamarida, the chief place in Sokotra, with the Sultan's heir on board, who is now the resident Governor of the island. Thus, while the sovereign rights of the Sultan of Keshin are respected, an arrangement has been made which is advantageous alike to the British Government and to the Arab chief.

We now proceed to give a concise account of the geography of the island. Sokotra lies between lat. 12° 19′ and 12° 42′ N., and long. 53° 20′ and 55° 2′ E. from Greenwich. Its westernmost point, Ras Shaáb, is at a distance of 148 miles from Cape Guardafui, on the African mainland, and the island is 82 miles in length, and 20 miles in width. Its area amounts to 1520 square miles. Almost the whole of its surface consists of primitive limestone, pierced, near the northern coast, by a picturesque range of granitic peaks, attaining a height of 4656 feet, and by porphyry, diorite, and other igneous rocks. The interior may be described as a table-land, apparently 700 to 1900 feet in height, intersected by broad and fertile valleys, and descending towards the coast in precipitous slopes and cliffs. Plains averaging 2 to 4 miles in width, in most places separate this table-land from the coast. That on the north has an argillaceous soil of reddish colour, mixed in some places with pebbles of augite and silex, and partly covered with *metayne* shrubs. Near the beach there are hillocks covered with grass. The southern plain—Nowkad or Nogad—is far more sterile than that in the north, and along the sea shore the wind has blown up ranges of dunes, which threaten to overwhelm the whole of the country to the foot of the hills. The rivers on the north side only fill their beds during the latter part of the south-west monsoon, but then so copiously and with such rapidity, that they are said not to be fordable by camels, even at a considerable distance from the sea. Several small streams near Tamarida and elsewhere are perennial.

The greater portion of the island may be described as sterile, affording in many instances not even pasturage for cattle, yet there are many localities of remarkable fertility, which would well repay cultivation. To a visitor approaching the island from the coast of Arabia during the north-east monsoon, say in January, it affords a pleasing contrast to the parched and arid scenery of Arabia. The neighbourhood of Tamarida is singularly beautiful. The hills near the beach and the valleys extending into the interior are clothed with bushes and trees, and beyond this zone of verdure rise the fantastic peaks of a granitic range, frequently enshrouded in mist. A few months afterwards, however, all is parched and barren, and no improvement takes place during the south-west monsoon.

The climate, thanks to the monsoons passing over a vast expanse of water, is comparatively cool, and by ascending into the hills almost any kind of temperature may be met with. The north-east monsoon blows from the middle of October to the end of March or beginning of April, and towards its close, as well as towards the close of the south-west monsoon, it rains copiously. The mean temperature of Tamarida amounts to about 70° in January and to 86° in June. February to May are the finest months on the north coast. The winter months (November to January) are least favourable to navigation, for squalls are frequent then, and vessels can hardly ride in safety at their anchors. The climate in the interior is exceedingly healthy, but on the coast intermittent fevers are prevalent at the change of either monsoon, and new-comers hardly ever escape them.

There is not a single harbour where a vessel can ride in safety protected from all winds, and only on opposite sides are vessels perfectly safe during the prevailing monsoons. At Tamarida the anchorage is very good except in the north-east monsoon. The Bay of Kathub is more sheltered from the south-west monsoons than Tamarida. Golonsir Bay affords anchorage in the north-east monsoons, as does also Shaáb Bay, though exposed to the south-west monsoons. Ghubbet Ne on the south coast, as well as Bander R'dresseh, near the eastern extremity of the island are safe during north-east monsoons. Bander Fikeh is sheltered by a reef against easterly winds. Bander Garrieh and Bander Delishi, on the north coast afford safety during the south-west monsoons, and the latter is the best sheltered anchorage on the whole island during that season.

There are only three places on the island which can lay claim to be designated as towns. These are Tamarida, Kathub, and Golonsir. Tamarida, the capital of the island, consisted, in 1834, of about 150 detached houses, not one-third of which were inhabited; and it is said of the town that it has twice as many houses as it has inhabitants, and more tombs

* *Transactions Bombay, Geog. Soc.* vii., p. 148.

† M. Guillain (*Documents sur l'Afrique Orientale*, 2me partie, vol. ii. p. 369) speaks of this occupation as "a violation of right by brutal might," but admits that the inhabitants would benefit from it.

‡ See *Ocean Highways* for January 1874, p. 401.

than both together. The houses are built of soft limestone and coral. They are usually two stories in height, the upper story being reserved for the harem, and have flat roofs surrounded by high parapets. The windows face towards the north-east, and are partly closed by wooden trellis-work. A small garden is attached to each house. There are two mosques at Tamarida, and two shops, poorly supplied with goods. The number of inhabitants does not exceed 100. The plain of Tamarida is well watered by three perennial streams, and exceedingly fertile. At the village of Suk, to the east of Tamarida, may still be seen the ruins of the ancient capital Hadibu, where even now fragments of armour and hilts of swords are occasionally dug up; and on a hillock in the plain, and on the slope of Jebel Rummel, are ruins of Portuguese forts.

Kathub is a village of thirty houses, and about double that number of miserable hovels. Its inhabitants engage in fishing.

Golonsir (Galansié) is a place of thirty or forty stone houses, with eighty or 100 inhabitants.* Wood and water may be obtained there, as well as sheep, goats, and fowls, but no bullocks.

The place Beni, mentioned by older navigators, is no doubt to be looked for near Bander Debeni of our map, to the east of Tamarida. The population is estimated by Wellsted at 4000 souls, but at some former period it appeared to him that it must have been far more numerous. The inhabitants are usually divided into "Arabs" and "Beduins," the latter inhabiting the mountains and the more sterile western half of the islands. The so-called "Arabs" are a mongrel race, descended from Arabs, Indians, Somalis, Portuguese, and other nations. They all wear the same dress, speak the same language, and observe the same customs, but their features are exceedingly varied, graduating from the negro type to that of pure Arab. Their dress consists of a single garment, viz., a shirt reaching below the knees, and confined round the waist by a leather girdle, to which is suspended all they possess of weapons. During the rains they wear a thick woollen coat over their shirt. The females wear a long chemise of Indian cloth, with a loose wrapper, the ends of which serve as a veil. They are bigotted Muhammadans, though ignorant of the leading doctrines of their religion. They live in houses or in huts, the latter being circular, with stone walls, and a conical or flat roof, covered with branches of the date tree.

Their chief occupations consists in the cultivation of small patches of ground, the tending of cattle, the minding of date-groves, fishing and trafficking, but the greater portion of their time is spent in idleness, coffee-drinking, visiting and gossip.

A far more interesting race of people are the so-called "Beduins," whom we may look upon as the aborigines of the island. They are divided into families or tribes, each occupying a defined domain, and having at its head a patriarch, whose office is generally hereditary, but whose influence is now hardly more than nominal. Sometimes he is called upon to arbitrate, but it is more usual for the injured party to take the law into his own hands. Fortunately the Beduins are a peaceable people, and having no weapons except stones and sticks, sanguinary conflicts, such as take place frequently amongst the Arabs, are exceedingly rare amongst them. The men are tall and well made, with open countenances, a slightly aquiline nose, expressive eyes, and a well-formed mouth.* Their hair curls naturally, without any approach to woolly or crisp texture, and is worn long, either plaited into tresses, or in curls. Beards and whiskers are frequent, but moustaches are not worn. The complexion varies a great deal, owing to intermarriage with Arabs, but is generally fair, and the skin clean and shining. The women are equally prepossessing as the men, and some of them are remarkably pretty. Wellsted observed that the legs of some of the more aged amongst them were of astonishing thickness, and they likewise exhibited that abnormal development of a particular region, which the Namaqua look upon as a mark of beauty. The dress of the men consists of a cloth wrapped round the waist, with the end thrown over a shoulder. In the girdle is placed a knife, and they carry a large stick in their hands. They wear no ornaments. The women wear a woollen cloth (usually of home manufacture), confined round the waist by a leather girdle, and a kind of wrapper of Dungaree cloth, which is thrown over the shoulders. They wear necklaces of red coral, amber or coloured glass, and large silver earrings, generally three or four in each ear. They go unveiled, and converse freely with strangers. The Beduins always dwell in caverns, which are exceedingly numerous in the limestone regions throughout the island. Wellsted visited one of these caverns which was 120 paces in length, and of corresponding height. The entrance was nearly blocked up by a huge overhanging rock, and the interior divided by circular stone walls into eight distinct compartments, each having a narrow door and inhabited by the same family. The larger portion of the cavern was given up to the sheep and goats, who seek shelter there during the rain. The articles of furniture are limited to a stone for grinding corn, to some skins to sleep on, and others to hold milk and water, some earthen pots, and a few woollen cloths (camelines) tied to the roof, and serving as a sort of hammock and cradle for the babies. The caverns generally swarm with fleas and other vermin, as well as with birds (and bats ?). The fire for culinary purpose is usually lit outside. Near some of them a large circular fold for the sheep and goats may be seen. It is enclosed by a wall of loose stones. The Beduins lead a wandering life rendered necessary by their being obliged to find pasturage for their numerous herds. The men attend to the flocks, and collect aloes and dragon's-blood, which, together with ghi (clarified butter), they exchange in the towns for dates, grain, and cloths. The females, as usual amongst barbarous nations, perform the principal share of the work, for, in addition to attending to their household duties, which include fetching water from distant wells, they assist in tending the flocks, make ghi (clarified butter), card and spin wool, and weave it into camelines, and tan skins, for which purpose they use the bark of the taleo tree. The

* According to Guillain (1847). Wellsted says fifty families.

* The Bahi Rahau, near Ras Mom, are described by Wellsted as having Jewish features, whilst the Camhan, in the granite mountains, are said to be descended from the Portuguese.

† The Lahsi tribe, numbering 150 souls, do not give their daughters to Arabs. But this is exceptional.

Beduins subsist chiefly on milk, grain, and dates. On feast days they kill a sheep or goat. They obtain fire by the friction of two pieces of wood. The Beduins, like the Arabs, are Muhammadans, and no traces of the existence of Christianity in former times have been discovered amongst them. The doctrines of Muhammad, however, sit lightly upon them. They neither observe the Ramadan nor the prescribed morning and evening prayers, they dance and sing, and are exceedingly hospitable to strangers, without difference of religion. Their children are circumcised only after they reach the age of puberty, and in the eastern part of the island there exists an ancient stone chair into which they are placed when this ceremony is performed upon them. There still exist traditions of ancient paganism. Trial by ordeal used to be practised by placing the accused, tied hand and foot, upon the summit of an eminence, where he was allowed to remain for three days. If rain fell during that period he was considered to be guilty and stoned to death. That superstitions should be rife amongst so secluded a people need not cause surprise. The modes of salutation amongst them are very varied. They include kissing the cheeks, the shoulders, the forehead or hands or knees, shaking hands, and rubbing noses, according to the degree of relationship, intimacy or social position. Wellsted has published a small vocabulary of the language spoken by these Beduins, which is probably the same as that spoken by the Himyaritic aborigines of Arabia.* It is said that books written in Chaldean (Ethiopian) characters existed formerly, but were destroyed when the Wahhabis made their descent upon Tamarida in 1800.

Amongst the natural productions of the island the first rank is due to the Aloe (*Aloe Socotrina, Lam.*), for which the island has been celebrated from time immemorial. It grows wild on the summits and sides of the limestone mountains, at an elevation of from 500 to 3000 feet above the level of the sea, and appears to thrive best in parched and barren places. In former times the collection and sale of the aloe leaves formed a monopoly of the Sultan, who farmed out portions of the island to different individuals, but at present any one so inclined may pluck the leaves of this valuable plant, which are placed in a skin to allow the juice to exude from them. The latter is exported from the island, and in 1874-75 there were 647 cwts. of Sokotra aloes imported into Bombay, valued at 1617*l.* The Sokotrine aloes, when pure, are the finest in the world; but owing to careless gathering and packing they are generally found to be mixed with impurities.† The produce of the island, ranking second to the aloe, is the dragon's-blood (*sanguis draconis*), a gum which exudes spontaneously from the *Pterocarpus draco*, a tree growing on the hills between 800 and 2000 feet above the sea level.‡ The *amara* yields a light-coloured gum, slightly odoriferous. Amongst all other trees the most important is the *date-palm*, which is met with particularly in the eastern part of the island, and supplies the inhabitants with one of their chief articles of food. There are no trees fit for building purposes; the metayne or malarah, however, a shrub rather than a tree, which abounds throughout the island, furnishes a wood as hard as the much-prized lignum vitæ. The nebek *(Lotus nebea)* attains a height of 20 or 30 feet, and its golden-coloured fruit is pounded into a paste, which the Arabs mix with ghi and swallow with much relish. The camels browse on the tender branches of the tree. The fruit of the tamarind or Indian date is converted into a cooling drink. There are also eshaib trees, similar to our weeping ashes, ukshars or wild grape trees; bohains, the representatives of the English sycamore, the leaves of which are relished by camels and sheep; the tuk, a species of wild fig, and several other plants of interest to the botanist, amongst which is the *Camhane*, which grows in rocky places, and curiously bears the name which Wellsted applies to the mountaineers of the granite range. Agriculture is attended to scarcely at all. Jawari *(Holcus sorghum)* is the only grain cultivated; and beans, melons and a little tobacco are grown in the gardens attached to the houses. There are also a few patches of cotton and indigo. Wild oranges and yams are met with in the granite mountains.* There is not the least doubt that cultivation might be extended to a very considerable extent, for many parts of the island are exceedingly fertile; there are running rivulets, and water could moreover be readily stored in tanks as in India.

The only domesticated animals are camels, oxen, sheep, goats, and fowls. The Arab chiefs who received Sir Thomas Roe, were mounted on horses, but that animal is no longer met with on the island; and asses, which were used as beasts of burden before the introduction of the camel, have been allowed to stray by their former masters, and now roam over the plains to the south of Tamarida in troops of ten to twelve. Dogs are not known. The camels, of whom there are perhaps 200 on the whole island, are more remarkable for strength than speed. Cows are numerous near Tamarida. They resemble those of Alderney, and their flesh, when young, is of the most superior quality. They are kept, however, principally for the sake of milk, and are killed for food only at the death of some person of position. Wellsted estimates their number at 1600. Sheep are found throughout the island. They are small, and their flesh is not very good. Goats are more numerous even than sheep. There are three distinct varieties, the most prized of which yields milk. Another kind, with shaggy red hair, is allowed to roam where it lists, and is looked upon as common property, and there are also wild goats, the flesh of which is much prized by the Beduins, who catch them in nets. The largest amongst the wild animals is the civet cat, and in former times the natives used to collect the perfume. The other mammals are mice and rats; monkeys, hyenas, antelopes, and other animals met with on the neighbouring continent are altogether unknown. The feathered tribe is represented by crows, wild ducks, wood-pigeons, swallows, lapwings, owls, vultures, flamingos, cassawaries, and others. Snakes are said

* *Journal R. Geog. Soc.*, vol. v. p. 220.

† For descriptions of the Sokotrine aloe see Pereira's *Materia Medica*, and Hanbury's *Pharmacographia*.

‡ The usual dragons' blood of European commerce is derived from the *Calamus Draco* (Willd.), which grows in Further India and in the East Indian Archipelago.

* Taylor (India Directory) also mentions pumpkins, water melons, and plantains.

to make their appearance in large numbers after the rainy season, and one kind is said to be poisonous. In the low lands abound scorpions, centipedes, and a venomous spider (*narġub*). Ants are equally numerous, and the cameleon is by no means rare. The sea swarms with fish, particularly on the south coast, which is also resorted to during the fine season by turtles. Amber and ambergris formed articles of export in former times. There is a pearl fishery off Tamarida, in 6 to 8 fathoms, carried on by divers from Omân.

Commercial enterprise is at a low ebb. Aloes, ghi, dragon's-blood, tanned hides, and pearls constitute almost the only articles of export. Dates and stuffs are imported. The trade is mainly in the hands of the Arabs, and is carried on by about twenty small dhows. Ghi constitutes the standard of value, but dollars and rupees are taken to be converted into earrings for their women.

The smaller islands in the channel which separate Sokotra from the African mainland, must be looked upon as dependencies of the former, as they rise from the same submarine plateau. *Saboynea*, a small granitic islet, 800 by 150 yards in extent, lies 10 miles to the north-west of Ras Shaáb, and is nearest to Sokotra. The *Brothers*, two islands of more considerable size—their joint area amounting to 10 square miles—lie about 30 miles to the south-west of Ras Shaáb. The larger island of the two is 7 miles in length, and rises to a height of 2440 feet. Neither of them is inhabited. About 40 miles to the west of Samheh, the larger of the Brothers, is *Abd al Kuri*, the largest of these islands, 26 miles in length, and nowhere more than 3 miles wide. It has an area of 65 square miles, is a sterile mountain island, affording but scanty pasturage to a few goats, and rising near its centre to a height of 1670 feet. There are no perennial streams, and the water of the wells near the coast is brackish. Bander Saleh (Leven Bay or Douconëdic) offers a secure anchorage during the north-east monsoons, which blow here from October to April. The surrounding sea abounds in fish, and pearl oysters are found on the Bacchus bank. The inhabitants, estimated at seventy souls by Guillain, are wretched in the extreme, and subsist principally by fishing. About 14 miles to the north of this island two islets rise to a height of 280 feet. They are called Kal Farun by the Arabs, Silhet by the inhabitants of Abd al Kuri, and Sabuhieh by the Sokotrans. They are much resorted to by sea-fowl, and covered with guano, which is occasionally exported by Arab dhows to the Red Sea and Southern Arabia.

FERGHÂNA.

THE Khanate of Kokand has at last been completely subjugated by the Russians, and by Imperial decree it has been converted into the Russian Ferghâna province of Turkistan. Of the three independent states of Western Turkistan, Kokand has ever suffered most from the vicissitudes of fortune, or, more correctly speaking, from domestic afflictions, for left to itself it has constantly struggled for dear life against the ravaging hosts of nomads who pounced down upon it from the surrounding mountains, and who have been the main cause of its annexation to Russia, but who in the end have fought the Russian *feringhi*, with a courage and desperation which convey to the Russians their first caution. This was the first consolidated State with which Russia, some 20 years ago, came into collision in Central Asia. Regular hostilities were opened five years after the erection of the first Russian fort (Raïm), at the mouth of the Jaxartes, when General Perofski, aided by Captain Butakof with his Aral flotilla, began the process of driving the Kokandians out of their forts on the Jaxartes, back on the city of Tashkend, a process which gave rise to the following doggerel, in the singing of which the men of the Syr Darian detachment found consolation and delight during an otherwise cheerless service :—

> "The Cossack, all the desert over,
> Is a free and gallant rover;
> While the rascal Kokandee
> Hastes to leave all forts and flee."

This period, 1852-3, was marked by the capture of Ak-Mesjid, which after a grandiloquent summons to surrender, was taken at the end of a protracted siege, when nearly the whole of the Kokand garrison was massacred.* The commandant of this fort (previous to its capture) is said to have been Yakub, the present Amîr of Kashghar, against whom it has been alleged, through Colonel Montgomerie's pundits, that he sold certain lands and fisheries to the Russians. What truth there is in this allegation needs not here to be inquired into, but it may be observed that with respect to these antecedents of Yakub-Khan, the Russians have ever observed a peculiar silence provocative of curiosity. Amicable relations between Russia and Kokand were finally established in 1868, when a treaty of commerce was concluded.

Before touching upon the late military operations which have sealed the fate of Kokand, one of the "questions" of that "time," which has now lapsed as far as concerns that khanate, and before commenting on the political aspect of that question, let us consider the extent and nature of this fresh Russian acquisition.

Since shorn of her outlying possessions in the basin of the Issyk Kul Lake, and in the valleys of the Upper Naryn, Chu, and Talas Rivers, in the beginning of the second half of the present century, and since deprived of all her dependencies to the north-west, following the course of the Jaxartes to its mouth (1853 to 1865)—equal to nine-tenths of her dominions—coupled with the alienation from her of all her tributary nomads of the outer plains, and some of the mountain Kirghiz on the north and east, Kokand has been confined within the limits of 70° to 74½° E. long. (Greenwich), and of 39° 40′ to 42° N. lat., that is to say, within that hollow of the Thian-shan Mountain system which embraces the headwaters of the Jaxartes, and about half the length of the fountain stream of that great river. This gives a superficial area of say 30,000 square miles.†

Fancy the interior of the ancient Coliseum of Rome, the *Plaza de Toros* at Madrid, the Albert Hall, or, better still, the immense crater of some smouldering, self-consuming volcano, and you have at once a very fair idea of the Khanate of Kokand.

Surrounded on all sides by terraced mountains,

* Vide Michells' *Russians in Central Asia*, p. 356.

† Fedchenko says 50,000 square versts or 1000 square miles German: *Travels in Turkistan, Khanate of Kokand*, vol. i., p. 15.

which render the country almost inaccessible, except from the south-west corner, the peaceful Uzbeg population has ever been at the mercy of the mountain clans who, representing an amphitheatre audience, and occupying the commanding positions, have invariably disturbed the harmony and controlled the destinies of those in the arena, affecting them in the ratio of their descent of the mountain gradients to their Kishlaks, or of their ascent to their Yailaks.*

The orography of the country as delineated on former maps has been completely altered by the late Mr. Fedchenko, who has established a system similar to that of the Kuenlun, of wide latitudinal elevations crowned with billowy heights, or with gradiating ascending or descending ranges running parallel with the main axis of the great Thian Shan embossment. He says, for example, that in following up the gorge of the Isfara River, he passed up in regular order from one lateral terrace to another until he reached Varukh, (north to south), whence east to west, as far as the Shah-i Mardan stream, which runs down to Marghilan, he found a regular cart-road between the ridges. The same system evidently prevails at the sources of the Chirchik and Angren Rivers—as it is indeed observable in the northernmost face of the Thian-shan upland, *i.e.* the Alexandrofski Mountains.

From the Chirchik, or Chatkal head of that river, by following a trough from W. to E., by ascending what is called the Shabitlyk Pass,† one may enter the Naryn region avoiding altogether the basin of the Jaxartes or Syr Daria. From Kokand there is no road to Aulièata‡ in the north, which does not traverse two passes. In this direction there are eastern affluents of the Chirchik and Angren, and western affluents of the Uzun Ahmed, a northern tributary of the Naryn. It may be discerned from Fedchenko's map, especially in the German edition attached to his work, as indeed, it is to be directly gathered from his statements, that the rivers flowing latitudinally have sharp turnings, by which they turn the flanks of the lateral elevations, and then pursue their course either westwards or eastwards. Another great feature confirmatory of Fedchenko's theory (an established fact in regard to the countries he actually visited), is that the greater rivers all run latitudinally, and all such as have a west or east course have wide and open valleys, while those that run longitudinally are mostly torrents, and rush wildly through narrow clefts.§ This is illustrated by the bend of the Naryn which forces its way from the north-east into the Kokand lowlands, through an impassable gorge—so determining the direction of the first mountain range skirting Kokand on the north. The two extremities, east and west of this country are contracted. The outlet is on the west down the valley of the Jaxartes through the Khodjend district, but there is also a road leading over the Kendyr Pass (6,700 feet) to the Angren River bordering the Russian district of Kurama.‖ The eastern limit is formed by the gradiating escarpment or "Devil's Dykes" of the elevated mass which lies between the Kashghar dominions and the Issyk-kul Lake, and which embraces the Naryn region. Here are several passes 10,000 to 11,000 feet high, which Colonel Poltoratski and Barons Kaulbars and Osten Sacken* examined in 1870 from the eastern side, while Fedchenko was within two days' march of them at Uzgend on the west.

The southern boundary of the Kokand hollow is defined by receding parallel ranges, as already shown in allusion to Fedchenko's route from Varukh to Shah-i-Mardan. The series of ranges here rise from 11,000 to 20,000 feet, the latter elevation being attained by the trans-Alai plateaux, which may perhaps be said to be the northern crest of the roof of the world or Bam-i-duniah. These several plateaux, abutting with their eastern margins in eastern Turkistan, doubtless fall away in that direction, similar to the western termini of the Naryn table-lands, while similarly studded with snow-capped peaks, giving them the appearance of longitudinal mountain chains.

Such is the structure of the Kokand hollow which, by reason of its being traversed from north-east to south-west by the river Jaxartes, is a valley known from time immemorial as the valley of Ferghâna, the native country of the Emperor Baber, who was a Moghul by descent from Chenghiz Khan through a younger branch in the fifth generation.† It would appear that in Baber's time, and especially in that of his father, the country was as commonly called Andijan from its then capital of that name "to which in Mâweralnaher,‡ after the fortresses of Samarcand and Kêsh, none was equal in size."§ The Russian Nazarof, who was fourteen months in Kokand in 1813-14, observes on this subject: "Andijan has no fortifications other than the Governor's Castle, which is enclosed within walls with five gateways, and which contains as many as 10,000 troops.‖ Each man occupies two rooms with his wife and horse—his wife being in one and his horse in another." Before Baber's time and even after it, Andijan conferred its name on the Khanate of Kokand, and was the capital of that principality which, from the period of Chenghiz Khan's extensive sway to the days of Baber's descendants, formed but a small portion of an immense empire, extending over Bokhara, Khorassan, Badakhshan and Cabul inclusive of Karateghin, Wakhan, Darwaz and Shugnan. I have said that Kokand is on all sides but one inaccessible, but this is as it may be taken in the sense of the ancient system of invasion, for Ferghâna was entered from the north in Baber's time by Sultan Mahmud Khan, who besieged Akhsi on the Jaxartes immediately below Namangan. It was also invaded by the Chinese from Kashgar through Osh in 1759, and apparently with the greatest ease. By the

* Winter and summer quarters, from the Türki *Kïsh* for winter, and *Yai* for summer. In the mountains south of Kokand these are also called 'Kstaù and Yailaù.

† Fedchenko's Map in *Ocean Highways*, No. 5, 1873.

‡ In Fedchenko's explanatory note to the map of the Khanate of Kokand, I find this name in the novel form of Aùlgata.

§ Small rivers intersecting wide plateaux between parallel lateral ranges, which finally burst through the mountains, form exceptions.

‖ This outlet is 10 miles wide at the narrowest point, and it affords the only two cart roads into or out of Kokand.

* The Naryn table-land may be said to be a little over 11,000 feet, Chatyr-kul Lake being 11,050 feet above sea level, and the Son-kul above the elevation of arboreal vegetation, may perhaps be some thousand feet lower, having outflows, which the first-named has not.

† Leyden's *Memoirs of Zehir-ed-Din M. Baber*, p.p. liv., lvii.

‡ Included in the dominions of the sovereign of Ferghâna, who extended his sway to Tashkend, Khorassan and Cabul.

§ *Baber's Memoirs*, p. 2.

‖ These in all probability are the 10,000 horsemen mentioned by Mir-Uzzut-Ullah, who preceded Nazarof in Ferghâna by one year.

Buddhist pilgrim Hiouen Tsang of the seventh century, Kokand is but cursorily mentioned in his travels under the name of Feï-han. Little or nothing was known of the country until the present century when Klaproth made Europeans acquainted with Nazarof's description,* and when Mr. Wathen of the Bombay Government published an account of it from descriptions of Ferghâna given him, amongst others, by the illustrious Muhammadan pilgrims in 1834.† We may even feel astonished at the degree of knowledge in respect of Kokand attained by our cartographers, in 1826, as displayed in Waddington's map attached to *Baber's Memoirs*, where the relative positions of the principal cities in Kokand are so well shown; albeit owing probably to an identification of the Naryn with the Yassy (which Fedchencko says is called Little Sir Daria, and is considered by natives to be the main source of the Jaxartes), they are out of place in respect to the Jaxartes.

The Chinese authorities are little satisfactory as regards the geography of the valley of Ferghâna, and throw but a faint light for the allocation of some of the extinguished cities of old. Mir Izzet-Ullah's (1812) account of travel first given to Europe, in Klaproth's translation in 1826, was more valuable and circumstantial than Nazarof's, but strangely enough his Persian text was not translated into English until four years ago, and then, too, his nomenclature was not given in his own Persian characters, which may be regretted as rather arbitrary.‡ In *Timkofski's Travels* will be found an extract on Kokand, which I presume was taken from the narrative of Agha Mehdi, the Cabul Jew, who early in the present century traversed Asia in the secret employ of the Russian Government;§ and we have, indeed, from Russian sources quite sufficient matter for a very full and comprehensive description of the topography and modern history of Kokand. Omitting the accounts by Pospelof and Burnashef who, in 1800, only went as far as Tashkend, there are the notes on Kokand by Potanin (1830); Veliaminof Zernof's invaluable work on Kokand, an interesting Russian work on Kokand written in 1849; Khoroshkin's notes (1869), often quoted; Fedchenko's excellent work (1875), irrespective of his various notes, and Mrs. Fedchenko's own observations; and various others.

Let us leave this valley for a few words on the roads leading out of it towards the south.

OSH TO KASHGHAR.

Two passes 7000 feet and 4100 feet respectively: Gulsha; about 13 miles from this place the road branches, one to the right over the Shart pass, and so on to the Alai plateau, and the other to the left over the Terek pass. This pass being strewn with bowlders is traversed more commonly when the inequalities of the ground are smoothed over with snow; it leads to the Kopké ascent, to a descent to Ikesak, or the twins (mountains), to Kok Su rivulet, to Tar defile, to Darvazé gorge, and to Tokai Bashi on the left source of the Kashghar River, where this road re-unites with the summer road from the Shart. The rest of this route to Kashghar we have here no occasion to follow up. It takes caravans 14 to 20 days' journey from Osh to Kashghar by this route, but special messengers do it in 5 on horseback. This is a more difficult route than that further east, from Issyk-kul Lake and across the Naryn River, which the Russians have made practicable for wheeled carriages, while the Terek *Davan* route is practicable for horses alone. Yet Mr. Fedchenko believes that a little labour bestowed upon the Terek pass will make the Osh-Kashghar route the principal channel of intercommunication. Abdul Mujid entered Ferghâna by the Kizyl-Yart pass and the Alai plateaux, presumably crossing the track leading up to the Shart pass (it was late in the season and most of the road was covered with snow),* for he traversed the Terek *Davan* on his way to Osh. This route is given by Mir-Uzzut Ullah, and by Humboldt in the third volume of his *Asie Centrale*, as well as by Ritter, from the itinerary of a Russian trader† It is also described under the head of *Course of Waters in Eastern Turkistan*, by a Chinese who was in that country in 1823.‡

Another mode of exit from or entrance into Kokand, and the most direct, is by the route from Badakhshan, Kulab, and Shughnan. Envoys from this latter independent State to Kokand§ travelled to the Muksu, a headwater of the Surkháb affluent of the Pandj or Oxus River, and said by Fedchenko to form the northern line of separation between Shughnan and the Alai. From the Muksu the road ascends the Great Alai, crosses the Kizyl Su‖ confluent, and after traversing two passes, 8000 and 11,000 feet high respectively, conducts over the Isfairam¶ pass into Ferghâna. Abdul Mujid returned to Kulab this way, presumably following the course of the Kizyl Su to its junction with the Muksu.

Of the routes passing in or out of Ferghâna southwards to the west of Isfairam, there is little or no information. That they exist, and are frequented by the nomad people of Karategin, is in evidence, and what would appear to be equally a fact is, that since the elevations run west by east in the form of crenellated terraces, there is a practicable line of route passing south of Kokand from the source of the Zerafshan River to the Muksu, and so up the Kizyl Su, striking the road to Kashghar, and intersecting all the roads from the south. I am led

* I cannot but observe that Klaproth's translation from the Russian is very free, and that one or two of his explanatory notes resulted from an incorrect reading of the Russian, and were made in that spirit of carping which he frequently displayed in his annotations of Russian works and translations. I could adduce striking instances, but they would fill pages. I may mention, however, that his annotations for instance, to Lloyd's translation of Timkofski, are all from Father Hyacinth's various Russian works, and he parades Hyacinth's information both to carp at and to correct Timkofski, and also uses it as a weapon of attack against Father Hyacinth himself; book-learned as was Klaproth, he most evidently detracted from others as much as he sought to win for himself. This becomes plain to anyone acquainted with the contemporary Russian authorities.

† *Journal of the Bengal Asiatic Society*, 1834, pp. 369-382.

‡ This was probably dictated by motives of economy; Klaproth, however, gave most of the Persian names.

§ Rawlinson's *England and Russia in the East*, p. 216.

* Selections from Records, xxxix, p. 6.

† Grigorief's *Eastern Turkistan*, vol. i., p. 224.

‡ On the basin of the Lob-Nor. Extract from a Chinese work, entitled, *Si-yu-shui-Dao-tsi*, translated by Uspenski.

§ The late Mr. Fedchenko relates that an envoy from Shugnan had lately been detained by the Khan of Kokand because the Shugnan people had pillaged the Kirghiz of the Alai. Note on *Map of Kokand*, p. 11.

‖ The southernmost point attained by Fedchenko.

¶ Isfairam is not to be confounded with Baber's Isfara, which is a full degree and a half to the west.

to this belief from the fact that the Russian scientific expeditions to the Zerafshan glacier in 1871, almost attained the Tarak head of it, which is shown to be traversed from north to south. It is true here is also the Stchurofski glacier,* and an aggregation of others, but from the account which was given of General Abramof's military expedition, in 1871, the idea is conveyed that further advance eastwards was practicable, though perhaps not then with artillery. We may gather even from Baber, that from Isfara and Varukh there are practicable routes to Poldarak on the Macha or Zerafshan, as also to other points on that river, and to Ura-tippa.

ROBERT MICHELL.

(To be continued.)

NEW MAPS OF MONGOLIA.†

AFTER the extensive surveys which the Jesuits carried on during the 18th century, and which served as a foundation for D'Anville's Atlas, cartography in China appeared to have remained at a standstill. But the appearance of Klaproth's map of Central Asia, in 1836, proved to us that such was really not the case, and that outside the wall, at all events, surveys were still being carried on, though not quite with the same skill as by the Roman padres. To Y. Y. Zakharof is due the credit of having been the first to collect and make known the results of the most recent explorations, and his maps of the Thian Shan, and of Western China have proved to us that the Government at Peking is as anxious now to obtain a knowledge of the configuration of the territories subject to it as it was at the time of the Jesuits. Zakharof and Nifantef's map of 1858 is in truth not only much more detailed than Klaproth's Asie Centrale, but likewise contains several features quite new to us. About twelve years after Zakharof, Chinese cartographic materials were utilized by Weber, who prepared from them an interesting map of Mongolia, as well as a detailed map of the province of Pe-chi-li, which prove in an unmistakable manner that the Chinese continue to improve upon their old maps. In 1869, whilst at Shanghai, I became acquainted with a large Atlas of China, which had been published by Governor General Ohu-guani, and is now being made use of by Baron Richthofen in the preparation of his map of China. It cannot be said, therefore, that the Chinese have no national cartography, though their maps are coarsely drawn, and the facts are entered upon them sometimes in a slovenly manner (?)

We have now before us quite a number of new maps, all of them of recent date, and none of them known outside China. Most of them are by Chinese, others by Mongol authors, and they have been copied by Mr. Karmazof, the dragoman of the Russian consulate at Urga, and are now in possession of the general staff. Mr. Karmazof has not only transcribed the Mongol names, but has likewise made a few valuable explanatory remarks. These latter I shall communicate in full, adding a few facts as regards dimensions, contents and execution of each map.

1. The largest of these maps delineates the territory of the Aimak of the Tushetu-khan on a scale of 11 versts to the inch. It was prepared, in 1868, by the Mongol authorities at Urga, in consequence of orders received from the Chinese Government. The original was forwarded to the Counsel of Foreign Affairs, at Peking, but a copy of it was made by order of Mr. Karmazof. This copy contains the names of even the smallest villages, the hills, drawn in the perspective as on all Chinese maps, towns, villages, isolated buildings, monasteries, &c. The meridians and parallels are drawn from 15 to 15 minutes, and the boundaries of the Aimak, as well as of the 'Khoshungs' of which it consists, have been carefully entered. This last is quite a novel feature on maps, for our notions of these boundaries have hitherto been rather confused. P. A. Helmersen, who travelled from Urga to the Kossogol, had indeed indicated some of the Khoshungs upon his route-map, but this was only fragmentary information, far different from the complete administrative map which we have now.*

Many geographical questions are settled finally by this map. Erdeni-dzao is placed to the east of the Orkhon, and near that monastery the tent of the Tushetu-khan. The course of the river Kharukha has been inserted with much detail, and many villages are placed along its banks. To the south of Urga, beyond the Khan-ola (mountains) we find a river Bukhain-gol†, which has not hitherto appeared on any map, and is lost in the desert before it reaches the Tola. The routes from Urga to Sair-usu and thence to the vicinity of Peking and Uliassutai have been entered with all their stations. I feel convinced that a reproduction of this map, say on half the scale, but without altering any of its features, would largely increase our knowledge of Mongolia, particularly as regards the basin of the Orkhon, and the adjoining parts of the Gobi. Combined with other materials, adjusted to the positions determined astronomically, and drawn in our European method, this map might be converted into a very satisfactory delineation of this sterile portion of Central Asia‡. The size of the original is 84 by 56 inches.

2. The second map, 49 by 35 inches, is one of the whole of Mongolia, and embraces all the countries from the Sungari and Nonna, to the Ala Tau of Dzungaria, and from the great wall to the Siberian frontier. It is copied from the last edition of a map of the Chinese Empire on a scale of 65 versts to the inch, which is about that of Klaproth's map. Portions of it are, however, far more detailed than the latter, for instance, the country to the south-west of Ning-hia, which is crowded with names, whilst Klaproth represents it almost as a blank. These names are those of colonies only recently established. In the steppes to the north-east of Barkul we find numerous lakes and rivulets, the existence of which proves the high altitude of that portion of Central Asia. The administrative boundaries are laid down carefully.

* So called by Mr. Fedchenko after the President of the Moscow Society of Lovers of Natural Science.

† From the *Estiyestya Russian Geogr. Soc.* xi., 1875. Part 6. p. 444.

* On Prshevalski's map some of these Khoshungs have likewise been inserted.

† A river Buguk-gol of Prshevalski's map may possibly be identical with this river.

‡ We trust M. Venyukof's advice, to publish this map in *fac-simile* will be followed.

3. The author of the third map is a Mongol. It embraces the Russo-Chinese frontier between Tsagan-usu and Khatkhulbun, to the west of Kiakhta. The narrow strip of Mongol territory is shown in much detail, and can easily be fitted to Schwarz's map. The paths connecting the Chinese and Mongol stations or posts are likewise indicated. Mr. Karmazof copied this map from the original, which was forwarded to Peking in 1868.

4. Another portion of the Russo-Chinese frontier, viz., that between Bayan-bulan and Biltis, has likewise been delineated by a Mongol. It is a mere road-map, about 28 inches long, and contains the boundary as well as the places on both sides of it. It was copied by Mr. Karmazof, and the original forwarded to Peking in 1868.

5. The fifth map shows the caravan routes between Urga and Kalgan, together with the boundaries of the Khoshungs, through which they pass. It was prepared by Mr. Karmazof himself, from information furnished by a Mongol well acquainted with the country.

6. These are sketches of the country to the south-east of the Dalai (Kulon) and Buyir Lakes, as far as the Khing-gan Mountains. Mr. Karmazof received these from Prince Chung-wang, who resides near these lakes, and who brought them to Urga in order that that they might be used in the settlement of a frontier dispute which he had with his neighbours, the Bargu-Solones.

7. These are finally itinerary sketches through the Gobi, supplementary to the general map of Mongolia, described sub (2). The routes given are:—(a) Urga to Ude; (b) Kalgan to Tsamin-ude (Darkan-tsam); (c) Tsamin-ude to Urga, and (d) Tsamin-usu to Urga by way of Choirin-tsam.

My notice of these maps shows sufficiently that they contain much valuable material for delineating more fully and accurately the whole of Mongolia, and particularly that portion of it not contained in my own map, published in the *Istvyestya* for 1872. By combining these Chinese and Mongol maps with the labours of Prshevalski, Matusovski, Ney Elias, Fritsche, Helmersen, Shimkevich, Shishmaref, Paderin, Vyes-elkof, and Butin, we are in a position now to produce a map of Mongolia far exceeding in value Klaproth's Asie Centrale.

M. VENYUKOF.

FREDERICK WALPOLE.

ON the 7th of September, 1844, there sailed from Spithead a ship, which bore on her books the names of many whose deeds will live in history, and who will be remembered by future generations of English sailors. H.M.S. 'Collingwood,' bearing the flag of Sir George Seymour, on the Pacific station, only had one commission, but it was one which was memorable in many ways. The happiest ship in the navy of her day, the 'Collingwood' was at the same time the best school for training men to attain distinction either in the naval or in any other branch of the public service. Her young officers have not alone left their mark in naval annals; yet in that branch of the public service Sir William Peel, Sherard Osborn,* James Goodenough* and others (for I speak not of the living) will be the subjects of some of the noblest chapters in our future naval histories. There, too, were Maurice Wemyss, the pure and chivalrous soldier, who afterwards commanded the mortar boats at Sweaborg; Richard Quin, gallant, genial and warm hearted; Augustus Kynaston, the steady but enthusiastic sailor, to whose creative talent a valuable invention is due, and who died of a wound received off Sebastopol; and Jones Byrom, who stood by his gun-boat until she sank under the deadly fire of the Taku forts. All now lost to us: taken away in the midst of their work, struck down in their prime. Of all those bright young spirits, full of a promise which in after life was so well fulfilled, the most popular, and among the most beloved was Frederick Walpole. But yesterday he was mourning over the loss of his old messmates Sherard Osborn† and Commodore Goodenough, "the midshipman of his watch," and now he too is gone.

The third son of the third Earl of Orford,‡ Frederick Walpole was born on the 18th of September, 1822, and entered the navy in 1837. He served in China during the first war, and afterwards under his cousin, Captain W. Walpole, on board H.M.S. 'Vernon,' in the Mediteranean. On the coast of Syria Frederick Walpole made the acquaintance of Eliot Warburton, and he went with that well-known traveller from Beyrout to Damascus. His love for the East dates from that period, and companionship with the brilliant author of the *Crescent and the Cross* was destined to leave its mark on the future career of the young midshipman.

Having passed for a lieutenant on the 26th of April, 1843, Walpole joined the 'Collingwood,' and served in her first as a mate, and afterwards, from December 30th, 1845, as a lieutenant, during the four happy years of her commission in the Pacific, from 1844 to 1848. The world was young to him, and all seemed bright and pleasant. It was a time without shadow or anxiety. Of how many joyous gallops and reckless escapades were Valparaiso and Callao, Honolulu and Papeite the scenes, when Walpole was the moving spirit of the 'Collingwood's' gun-room! But through all, even the maddest excursions, the wildest freaks, there ran a vein of chivalry and romance.

Of the various regions of the great South Sea, Chile was the land in which Walpole took the greatest interest. His uncle, Colonel Walpole, was British minister at Santiago, hence he saw much of the country and the people. He hoped to visit Chile again in after years, but it was not so destined, though his anticipations for the future of the country, where he had passed so many happy days, bid fair to be fulfilled. After his last look at the snowy peak of Aconcagua, he thus apostrophized Chile in his journal:—"Look down mighty monarch of the West, and guard the small Republic nestling at thy feet. May it yet prove as great in its day as thou dost ever in thy eternity; may its gentle daughters be pure as thy snow, its sons strong as thy strength; white as thy summit be their virtues; bold as thy front their courage!"

* See *Geographical Magazine* for June 1875, p. 161.

* See *Geographical Magazine* for October 1875, p. 289, and November 1875, p. 325.

† See *Geographical Magazine* for June 1875, p. 170.

‡ Of the present creation.

The 'Collingwood' returned to England, and was paid off on the 20th of July, 1848. Walpole, and all the rest of that glorious company, left the old ship with feelings of regret to which he thus gave expression:—"The tried friends, the brother voyagers, whose names were associated with all our frolics, all our fun; who had laughed at our mishaps, grieved over our misfortunes, and befriended us in many curious scenes, would soon be scattered, perhaps only to meet again when age and selfishness had steeled the heart against old recollections. But the fiat had gone forth, and it was with a sad and heavy heart that I stepped into a shore boat; and as I pulled away the sunset-gun fired, and the pennant was hauled down—that pennant I had followed through weal and woe 83,000 miles."

For some time Walpole's thoughts continued loyal to the coasts and islands of the Pacific, and in July 1849 he published his pleasant record of the 'Collingwood's commission.* But ere long he turned to his first dream of romance in the far East, and he never served afloat after Sir George Seymour's flag was hauled down. In 1849 he was again on his way to Syria, whence he wandered through Diabekir and over Mesopotamia, visiting Mosul, Baghdad, and the ruins of Nineveh; and living for some time in tents, with Mr. Layard, upon the excavated mounds. He thence travelled across Armenia, by Erzeroum to Trebizond, and so to Constantinople. His second journey in the East was of more special interest, as its object was to make acquaintance with the Ansayrii, for which purpose he made Latakia his headquarters, and thence he visited and studied that people and their history. His travels in the mountains of the Ansayrii were new, and many of the places that he saw and described had never before been visited by Europeans. The narrative of these eastern travels was published in 1851.†

On the breaking out of the Crimean war, the great eastern experience of Frederick Walpole, and his knowledge of Arabic, pointed him out as a valuable leader in the Turkish contingent, and during that memorable period, from 1854 to the end of 1855, he did excellent service in Syria, and afterwards in Turkey, as a commander of Bashi Bazouks, at Shumla and elsewhere. He remained in the East for some years after the close of the war, and acquired extraordinary influence over the Arabs of Syria.

On the 12th of February, 1852, he had married his second cousin Laura, only daughter of Francis the son of the Honourable Robert Walpole, and after his marriage his seat in the country was Rainthorpe Hall, near Long Stratton in Norfolk, the old home of the hapless Amy Robsart, of whose family the Walpoles were the eventual heirs. Three children were born to him, two sons and a daughter. His eldest son, Robert Horace, was born in 1854, entered the navy, was recently a midshipman in H.M.S 'Blanche,' on the Australian station, and became an acting sub-lieutenant on November 23rd, 1875. His second son, Clare Horatio, was born in 1858; and his only daughter, Amy Rachel, was married in 1872 to the Honourable Henry Charles Manners Sutton, eldest son of Viscount Canterbury.

Walpole paid more than one visit to the East in after years. He was a staunch Conservative in politics, a good antiquary and herald, and a geographer, but caring for that science more on its comparative side, and as the basis and framework of historical research. In 1860 he became a Fellow of the Royal Geographical Society, and in 1865 a member of the Hakluyt Society. He was also a member of the Geographical Club. In 1865 he unsuccessfully contested Lynn; but in November, 1868, he was elected member of Parliament for the northern division of Norfolk by the small freeholders and farmers, in spite of the oppositon of the powerful Whig landlords, and he was returned again at the last general election in 1873. He had become a retired commander in the navy in October 1864, and was major in the West Norfolk Militia. Frederick Walpole was a man of brilliant parts, imaginative, and full of poetic instincts; but he was wanting in the power of steady and continuous application, and in the faculty of arrangement and concentration. Hence many of his aspirations remained unrealized and much of the work he once planned and hoped to achieve was never done. But this, alas! is the fate of us all, and it is only because an imaginative man conceives and plans more than others, that his career, to those who are intimate with him, appears incomplete. Through life Walpole was brave and generous, gifted with conversational powers of a high order, a most pleasant companion and a true friend; and there are many who will long mourn the loss of a much-loved messmate, whose place among them can never more be filled. But a few weeks ago he was talking over old times, and speaking with regret of the loss of dear friends, remarking how fast they were falling away. His own death was terribly sudden. He expired on the 1st of April, 1876, of pleurisy, at his house in Dean Street, Park Lane, after a very few days of illness, having reached the age of fifty-four years and a half. He was buried on April 7th in the village churchyard of Kingsbury, near Edgware.

* *Four years in the Pacific in H.M.S. 'Collingwood.'* By Lieutenant the Honourable Fred. Walpole, R.N. (2 vols. Bentley, 1849). For a notice of this charming work see *Ocean Highways* or November 1873, p. 332.

† *The Ansayrii and the Assassins, with Travels in the Further East.* By Lieutenant the Honourable F. Walpole, R.N. (3 vols. Bentley, 1851).

Personalia.

Dr. RETZIUS, Dr. MONTELIUS and Mr. TEGNÉR propose to start in September next for Central Asia, with a view to archæological explorations. The expenses of the expedition are estimated at 1800*l.*, of which 1500*l.* have already been promised by a patron at Gotheburg.

THE German African Society have determined to send Mr. Mohr, the author of *To the Falls of the Zambesi*, to the West Coast of Africa, to take up the work left incomplete by Homeyer and Güssfeldt. He proposes to start from Loando.

THE medals of the Paris Geographical Society have been awarded this year to D. Nachtigal, Colonel Prshevalski and Mariette Bey.

Signor G. ADAMOLI, an energetic young traveller of Milan, already known for his explorations in Central Asia, and for having accompanied General Abramof's expedition to the source of the Zerafshan, is about to visit Morocco with the hope of eventually penetrating and exploring some considerable distance in the interior of Africa.

Reviews.

—:o:—

THE LIFE OF WHEELWRIGHT.*

THE life of such a man as William Wheelwright, of whom we gave a short obituary notice in a former number,† is one which deserves a careful and appreciative biographer. His achievements are peculiarly valuable to geographers, because they have on the one hand facilitated communication and opened up almost unknown countries, and on the other they have directly led to the execution of valuable geographical work. South America owes a deep debt of gratitude to the memory of its great benefactor, and we rejoice to find that this feeling is in full force. It is specially appropriate that the author of a life of Wheelwright should be a South American, and in Señor Albérdi the subject has a fitting biographer. A native of Tucuman, formerly Minister for the Argentine Republic in London and Paris, and an old friend of him whose labours he records, Señor Albérdi is well fitted for the task he has undertaken, and he has performed it with good feeling, judgment, and literary skill. The book is pleasantly written, and contains much valuable information. It is a just tribute to the memory of a great and good man, on the part of a native of the Argentine Republic. The Chilian Republic has also shown similar grateful appreciation of the labours of Wheelwright by the erection of a statue to his memory.

The family of William Wheelwright, originally from Bilsby, near Alford, in Lincolnshire, settled at Newbury-port, on the coast of Massachusetts, in 1627. Here William was born in 1798, and his father, Ebenezer Wheelwright, being a shipowner, he took to the sea, and at the age of twenty-five was in command of one of his father's vessels. He was shipwrecked off Cape Corrientes in 1823, and went from Buenos Ayres to Chile. For a year or two he traded along the west coast of South America, and in 1825 became United States Consul at Guayaquil. In 1829 he returned to Chile, and established a line of sailing vessels for carrying passengers between Valparaiso and Cobija, he himself commanding 'La Veloz Manuela,' a little craft which became famous for speed, punctuality, and the good treatment of passengers.

In 1835 Mr. Wheelwright commenced his great undertaking, the establishment of a line of steamers along the west coast of South America. The enterprise was one of extreme difficulty. There were prejudices to be overcome, capital to be obtained, and negotiations to be conducted, which required the exercise of much skill and patience. Mr. Wheelwright was a man of strict probity, and this was the chief cause of his success. He was also endowed with great ability, untiring energy and perseverance, and a genial disposition. Having secured the necessary privileges from the Republics of Peru and Chile, he went to England in 1838, and from that time the native land of his ancestors practically became his adopted country. In those early days Mr. Wheelwright derived much aid from the advocacy of his project by Mr. Scarlett, then a young attaché who had recently made a tour in Chile and Peru.* He was also warmly supported by Sir Edward Parry and Captain Fitz Roy. But his success was mainly due to his own industry, to the information he collected, the extent and minuteness of his calculations, and to the confidence he inspired among capitalists. The Pacific Steam Navigation Company was formed in 1838, with a capital of 250,000*l.*, and two steamers were built of 700 tons and 150 H.P. by Messrs. Charles Young and Co., of Limehouse, called the 'Peru' and 'Chile.' Captain Fitz Roy, in a letter written to Mr. Wheelwright at this time, said:—"I cannot help expressing my admiration of the patience and candour by which you seem to have been actuated during the four years you have devoted to the preparation of this great undertaking."†

In 1840 Mr. Wheelwright went out, by the Straits of Magellan, with the two steamers, one being commanded by Captain Peacock, a Master in the Royal Navy, and the other by Captain Smith, formerly of the East India Company's Marine Service. They arrived at Valparaiso on the 16th of October, being the first steamers that had ever been seen on the Pacific coast. They entered the port under salutes from the batteries and from all the ships of war, military bands in launches, and hundreds of boats met them outside, and the day was universally regarded as, what it indeed was, the opening of a new era in the history of Chilian progress. In Callao a similar welcome awaited the arrival of the steamers, and General Gamarra, then President of Peru, was officially received on board. Señor Albérdi truly says that the solemn installation of steam traffic in the Pacific by that noble soldier of free industry, William Wheelwright, is an act worthy of greater admiration than the assumption of the sovereignty of the South Seas by Blasco Nuñez de Balboa, or than the victories which secured the liberty of those seas won by Cochrane and Bolivar.

The 'Peru' and 'Chile' ran between Valparaiso and Callao, but it took five years before the line could be extended to Panama, during which time there was a loss of 72,000*l.* out of 94,000*l.* of paid-up capital. But the confidence of the shareholders in Mr. Wheelwright's management induced them to persevere, and, in 1847, a small dividend of two-and-a-half per cent. was at length paid. The management in England of the Pacific Steam Navigation Company was, in 1846, removed from London to Liverpool, and Mr. W. Just became the manager. Four steamers, costing 180,000*l.*, called the 'Lima,' 'Santiago,' 'Quito,' and 'Bogota,' were sent out, and in 1846 the line was extended to Panama, the mails being carried in connection with Royal Mail steamers on the West Indian side of the isthmus.

The great difficulty was the cost of coal, but in 1842 Mr. Wheelwright examined the deposits in the south of Chile, and at once began to work them and to use the coal shipped from the port of Talcahuano,

* *La Vida y los trabajos industriales de William Wheelwright en la America del sud.* Por J. B. Albérdi. (Paris, 1876.)

† November 1873, p. 340. See also Sir Bartle Frere's Anniversary Address, *R. G. S. Journal* for 1874, xliv. p. cxlvii., and *Lindsay's History of Merchant Shipping*, iv. p. 316 *(n)*.

* Author of *South America and the Pacific* (2 vols. 8vo., 1838). By the Honourable P. Campbell Scarlett.

† *Statements and Documents Relating to the Establishment of Steam Navigation in the Pacific.* A pamphlet of 42 pages with maps, 1838.

for the Company's steamers. He also devoted much attention to the improvement of the ports, the reform of postal and customs arrangements, the erection of the Valparaiso lighthouse, and the construction of moles. He was ten years in establishing the line of steamers from Valparaiso to Panama, and ten years in completing and consolidating it, and by 1855 the grand enterprise was crowned with complete success. Mr. Wheelwright retired from the management in that year. The creation of the Pacific Steam Navigation Company was the great achievement of his life. It continued to prosper, and from 1860 the trade of the Pacific was rapidly developed. In 1867, the profits having continued to increase, the directors resolved to establish another line from Liverpool to Valparaiso and Callao, by the Straits of Magellan, and several magnificent steamers were built for it. In May 1868 the 'Pacific,' of 2000 tons and 450 H.P., was sent out as a pioneer by this route; in 1871 there were twenty-nine, and in 1872 as many as thirty-seven voyages made round from Liverpool to Callao. We have already described one of the steamers, the 'Aconcagua,'* of 4106 tons, and there are several others of even larger dimensions. At one time the Company paid twenty per cent.; and it now owns fifty-four steamers with an aggregate tonnage of 119,870. Mr. Lindsay truly says that the Pacific Company, the creation of Mr. Wheelwright, has essentially aided the cause of progress and the happiness of mankind; and that there is a great future for this Company if it is wisely and prudently conducted.

Mr. Wheelwright, during the period of his superintendency, was actively engaged in the preparation and execution of other projects for the good of the west coast of South America, and especially of Chile. He introduced gas and a supply of water by iron pipes into Valparaiso. In 1842 he proposed to the Government of Chile the construction of the railway from Santiago to Valparaiso, which was then thought impracticable, but which was afterwards completed. It was three years after this, in 1846, that I first saw Mr. Wheelwright. Rapid movement was a necessity of his work, and we met him, the late Commodore Goodenough and I, dashing into Casa-blanca in a *birlocho*, on his way to Santiago, with about a dozen fresh horses driven before him, and raising cloud of dust. We had the last half of a ride of 72 miles before us, and seeing that our horses were tired he kindly remounted us.

In 1849 he undertook the construction of a railway from the new port of Caldera, which he created, to Copiapo, a distance of 50½ miles, with a maximum gradient of 60 feet per mile, terminating at an elevation of 1327 feet above the sea. The line was completed in 1852, the new port of Caldera was laid out, and in 1854 extensions of the Copiapo railroad were made to Chanarcillo, surmounting an elevation of 4470 feet, and to the great northern mining district of Tres Puntos, which has an elevation of 6600 feet at the terminus.

After retiring from the management of the Pacific Steam Navigation Company in 1855, Mr. Wheelwright conceived the magnificent idea of constructing a railway across the Andes and connecting Chile with Buenos Ayres. He expected that practicable gradients might be found, and he organised a staff of engineers to survey the line. He thus, in completing a section across the Andes from Copiapo to Fiambala, did valuable geographical work. He became a Fellow of the Royal Geographical Society in 1859, and communicated a most interesting paper on the proposed route from Caldera in Chile to Rosario on the Parana, by way of Cordova, which was read at a meeting of the Society on January 23rd, 1860.*

In the same year he proceeded to Chile with his family, and I was their fellow passenger in the steamer down the west coast, landing at the port of Pisco, on February 29th, 1860, to see the splendid iron pier, nearly half a mile long, which Mr. Wheelwright had constructed for the shipment of merchandize at that great centre of the Peruvian wine and spirit trade. Mr. Wheelwright was accompanied by his wife, and his young son, a youth of great promise, who was cut off prematurely a few years afterwards. They were full of the great project which was about to be submitted to the Chilian Government. The whole survey had been made by Mr. Edward A. Flint in 1859, and the scheme included two tunnels on the Chilian side; the highest level, on the San Francisco Pass, being 16,023 feet above the sea. The line would pass through a region rich in copper, sulphur, lead, zinc, and salt. The distance from Caldera on the Pacific coast to Rosario on the Parana is 934 miles.

The enterprise was considered too vast for the Chilian Government to undertake at that time. Mr. Wheelwright, undaunted and still full of hope, then resolved to commence the line from the other side, at Rosario, and this took him once more to the Argentine Republic, which he had not visited since, as a very young man, he was shipwrecked off Cape Corrientes in 1823.

On March 16th, 1863, General Mitre, the President of the Argentine Republic, signed the concession to Mr. Wheelwright and Mr. Thomas Brassey, for the construction of a railroad from Rosario to Cordova, its ultimate destination being the shores of the Pacific. Mr. Wheelwright returned to England in July 1860, and attended the meeting of the British Association at Newcastle. It was here that I saw him for the last time, again in company with the late Commodore Goodenough; and his instructive and interesting conversation during successive evenings, in which he gave us valuable information respecting the great and beneficent works he had completed, and that he was about to commence, renewed many pleasant memories connected with the west coast of South America

From that time until the year of his death Mr. Wheelwright was constantly passing to and fro from London to Buenos Ayres, zealous and indefatigable as ever, at an age when most men are seeking rest. He was now close upon his seventieth year. The railway rapidly progressed and, hand in hand with the works, went schemes for the improvement and colonization of the country. In his concession Mr. Wheelwright had obtained a grant of one league on each side of the line from Rosario to Cordova, for the entire extent; and he took the deepest interest in establishing farms and settlements on the Company's land. He also conceived the idea of opening a port for Buenos Ayres on the shores of the Atlantic, and that of

* *Ocean Highways* for October 1872, p. 213.

* See *R. G. S. Journal*, xxxi. p. 155.

Ensenada was selected, twelve leagues to the south of the capital, with which Wheelwright eventually connected it by a railway.

On the 17th of May, 1870, the Rosario and Cordova Railway was opened, and the second great work of Wheelwright's life was thus completed. He returned to London in the same year, and received news of the death of his colleague Mr. Brassey. After a visit to his native land for the last time, Wheelwright, who was now 73 years of age, again made a voyage to Buenos Ayres in 1871, and on the 18th of April, 1872, his last work, the Ensenada Railway was opened as far as Quilmes, on the banks of the Rio de la Plata. By the end of that year the line was completed to the port of Ensenada. It was inaugurated on the last day of 1872; and in 1873 the brave old man, in harness to the very last, returned to England with his health completely broken down. He lived to reach his adopted country, and died in his own home, Gloucester House, Regent's Park, with his wife and daughter Augusta, his son-in-law, Mr. Paul Krell, and many friends around him, on the 26th of September, 1873. He had reached the age of 75. In accordance with his last wish, his son-in-law conveyed the body to America, where it was buried at Newbury-port, in Massachusetts, the place of his birth.

Wheelwright devoted his long and useful life to the service of South America, and few men have had the good fortune to complete so many great and important works. He was ever influenced by the highest and most disinterested motives, and his earnest desire was to be of service to those among whom his lot was cast during many years of his life. He was a benefactor to the South American States; and the admirable work of Señor Albérdi, recording, as it does, the beneficent achievements and devoted services of this great and good man is calculated to be a permanently valuable record of a life-story which should never be forgotten in Peru, Chile, and La Plata.

CLEMENTS R. MARKHAM.

——:o:——

RECORDS OF THE PANDORA'S CRUISE *

THE cruise of the 'Pandora' in 1875, apart from the great public service performed in bringing home the Arctic mail, was, in several respects, a useful and practically valuable enterprise. Hydrographical notes were made, charts were corrected, and a very important portion of the Arctic seas was navigated for the first time. Opportunities were afforded for the acquisition of experience in ice navigation by several young officers, and especially the navy of a friendly nation was ably represented; while a practised hand was given the means of vividly depicting Arctic scenes, and of once again bringing them freshly before the imagination of the present generation of readers.

These three separate results have been duly recorded. The narrative, written during the voyage by Captain Allen Young, has been printed, but only for private circulation, in order that there may be an authentic record of the expedition and of its objects. These were to visit the western coast of Greenland, thence to proceed through Baffin's Bay and Barrow Strait towards the magnetic pole, and, if practicable, to navigate through the North-west Passage to the Pacific Ocean in one season. As in following this route, the 'Pandora' would pass King William's Island, it was proposed, if successful in reaching that locality in the summer season, to make a search for further records, and for the journals of the 'Erebus' and 'Terror.' It was intended that the necessity for wintering should be avoided if possible, unless such a position could be attained as would render it advisable. But the vessel was fully equipped and provisioned for a winter, and the crew were engaged for a period of two years. Captain Allen Young's journal is annotated throughout, and well illustrated. It contains valuable hydrographic remarks, and in some parts, especially where the perilous race with the ice round Cape Rennell is described, the narrative is most graphic and deeply interesting. It will form a valuable permanent record.

The second record is the report of Lieut. Koolemans Beynen to his Minister, which has been published at Amsterdam by the Dutch Geographical Society. In the introduction Mr. Beynen gives an account of the voyage of Sir John Franklin 1845-48, and of M'Clintock's expedition in the 'Fox,' with a sketch of the former Arctic services of Allen Young. Full details are also furnished of the equipment of the 'Pandora,' the provisions, clothing, and instruments; and valuable information respecting the ice and ice navigation. The narrative is admirably written, and contains, some very complete statistics of the cryolite mine at Ivigtot, the results of meteorological and other observations, and a list of mineralogical specimens named by Heer Behrens of Delft. Lieutenant Beynen is a most enthusiastic young Arctic officer. We are told by his shipmate, MacGahan, that Beynen's place in a gale of wind was at the weather earring of one of the topsail yards. He was a universal favourite, and for his seamanlike qualities and scientific acquirements, a great acquisition to Captain Allen Young's expedition. Since his return he has been occupied in Arctic studies, and has, after careful research, written a very able introduction to a second edition of Barents's voyages for the Hakluyt Society. We are glad that he is again to sail with his old captain in the 'Pandora' in the forthcoming voyage.

Mr. MacGahan's share of the work has been to give a popular account of the expedition, and he has done it right well. His book is very agreeably written, and furnishes a graphic sketch of Arctic scenery, and of the incidents of an Arctic voyage.

——:o:——

THE GREAT DIVIDE. *

LORD DUNRAVEN is a young nobleman, who has for the last few years devoted much of his time to hunting expeditions in various portions of North America. In the summer of 1874 he visited, in company with some friends, a part of the West less known in Europe

* *Cruise of the 'Pandora' from the Private Journal kept by Allen Young, R.N.R., F.R.G.S., Commander of the Expedition.* (Private circulation).

De Reis de 'Pandora,' naar de Noordpoolgewesten in dem zomer van, 1875. Door L. R. Koolemans Beynen. (Amsterdam, 1876).

Under the Northern Lights. By J. A. MacGahan, *(correspondent of the New York Herald).* (Sampson Low, 1876).

* *The Great Divide: Travels in the Upper Yellowstone in the Summer of* 1874, by the Earl of Dunraven, with illustrations by Valentine W. Bromley. London: Chatto and Windus, 1876.

than almost any other portion of the region within the shadow of the Rocky Mountains. The Continent now being spanned by the Pacific Railway, there are no very few spots in its vicinity that have not been honoured with a visit from some of the roving Englishmen with whom the Prairies of North America and its western mountain regions have been for some years popular haunts. But hitherto it has only been from the works of Professor Hayden and other scientific American explorers that we, in this country, know anything of the interesting section of Montana Territory, to which the greater portion of this lively and interesting volume is devoted. With the exception of the banks of the Hudson, Lake George, the mountainous districts of New England, of Virginia, and other spurs and offshoots of the Alleghanies the general character of American scenery, east of the Rocky Mountains, is flat, dreary, and uninviting. Civilisation has only added to the natural tameness of the landscape. The fields of the graceful tasselled maize may look pretty, but a clearing of half-charred stumps, surrounded by a "dog-leg" fence, gives an unkempt, "vulgar look" to the confines of western civilisation. Most of the regions west of the Rocky Mountains excel, however, in every variety of lovely or majestic scenery, and immediately to the east of the great central range are valleys compared with which there is little in the Old World to boast of. In the territories of Montana and Wyoming there is such a district. The altitudes are not so high as some other portions of America, but it is, nevertheless, the watershed of the Continent. Thence the waters flow—north, south, east, and west. The great rivers that here rise course through hundreds of miles, from perpetual snow to the torrid zone. "On one side glance the currents destined to mingle with the tepid waters of the Gulf of Mexico; on the other, up the rapids, leap the salmon ascending from the distant waters of the Pacific Ocean. It is the geographical centre of North America." It is essentially the "Great Divide." In these wild, trackless wastes roam the last remnants of the thriftless vagabond race who once owned all the fair land. Here the traveller may study, possibly in too close proximity for the safety of his scalp, the gigantic Crows—men averaging 6 feet 4 or 5 inches in height, Bannacks from Idaho, Pond'Oreilles, Gros Ventres, Flatheads, Bloods, Piegans, warlike Blackfeet, Assineboines, and Sioux. These hapless aborigines wander through the hunting-grounds of 'The Great Divide,' "seeking their meat from God: stealing horses, hunting, and warring upon one another in something like their natural freedom." Some, like the Sioux, or Dakotahs, as they call themselves, are hostile to the whites. Others, like the Crows Snakes, and Bannacks, are tolerably friendly. The Nez Percez and Bannacks are semi-civilised, while the Blackfeet and Assineboines are primitive and unsophisticated. The Great Divide is a hunter's paradise. Here still lingers the ungainly moose. In the valleys are white-tailed and black-tailed deer. The mountain buffalo grazes in the little prairies, open glades, and sparsely-wooded slopes. Pronghorn antelopes are numerous on the plains or foot-hills, while "clear against the sky-line, standing on some jutting crag, may not unfrequently be seen the massive stately outline of a bighorn or mountain sheep, a near relative to the moufflon or argali; and far up in the wildest pastures of the range, among untrodden peaks, wild goats, distantly allied to the eastern ibex, have their inaccessible abode." The sportsman, whom this list of *feræ naturæ* does not satisfy, may, if he feels so inclined, face the grizzly bear. Nowhere, except perhaps in Southern California, is it more common. "If he is ever pursued," Lord Dunraven adds with a quiet humour which is characteristic of the man, "or has been pursued by that unpleasant beast, he will perhaps be gratified to learn that, as a rule, pine trees are numerous and not difficult to climb." North America, however, cannot for a moment compare with Africa or India as a hunting country; but what it loses in the number and variety of game, it gains in the enjoyable climate and the charming surroundings which in the best hunting-grounds almost everywhere meet the eye. To be successful in sport even in the best localities, a hunter requires considerable experience of the country. He must also be careful not to pronounce an adverse verdict merely upon the result of one year's experience, for the game is very migratory, and where there is abundance in one season, there may be almost none the next. The Indians are the game preservers of the country. Nothing irritates them so much as the wholesale destruction and waste of food indulged in by the whites. Every year the frontier hunters kill thousands (Lord Dunraven says millions) of buffaloes for their hides, "and thousands of deer and wapiti for their skins alone, leaving their bodies to rot and fester in the sun." The region is rich in minerals. Gold is abundant in Montana, but transportation is laborious and expensive, so that the mines are almost undeveloped. Silver is also found in plenty, and when the long-delayed railway is run through this region these mines will yield a rich return.

But the great centre of attraction in the Great Divide, or, as it is not inaptly called by the inhabitants, "Wonderland," are the Geysers, or "fireholes." The region is also sometimes called the "Upper Yellowstone Country," the "Upper and Lower Firehole Basin," or the "Geyser Basin." It is this district which is chiefly described in Lord Dunraven's volume. It has been reserved from sale or settlement by the United States Government as a grand national park. The area contained in the reservation measures 3578 square miles, roughly speaking within the meridians of 110° and 111° west longitude and 44° and 45° north latitude. The general elevation is about 6000 feet above sea level, while the mountain ranges that hem in the narrow valleys on every side attain to a height of from 10,000 to 12,000 feet. "The winters are too severe for stock raising, and as frosts occur at night during nearly every month in the year, agriculture is out of the question. The rocks are generally volcanic, and there is but little chance of mineral deposits being concealed in them. It is, therefore, for ordinary purposes a valueless region, capable of supporting only wild beasts, and wilder men who prey on them." It is nevertheless a wonderful country. The Mammoth Hot Springs of Gardiner's River, and both the Geyser Basins are situated in it. Entombed in its forests, at a height above the sea of 7788 feet, lies a large and lovely lake which is, with the exception of Lake Titicaca in Peru, and Mansarowah and Tengri Nor in Tibet, the highest body of water of any considerable size in the world. In the snows that fall upon

the summits surrounding this "Happy Valley" are born four of the largest rivers of the continent—the Yellowstone, the three forks of the Missouri, the Snake, and Green Rivers. "Thus," concludes the lively author of the volume under review, "it is, as auctioneers would say, a most desirable park-like property; and if government had not promptly stepped in, it would have been pounced upon by speculators, and the beauties of nature, disposed of to the highest bidder, would have been retailed at so much a look to generations of future travellers." For an account of the five routes by which "Wonderland" can be reached, and of all the adventures and moving accidents by flood and field, which befel Lord Dunraven's party, we must refer the reader to the book itself. It is not a scientific work, though containing many scientific details, mostly from Professor Hayden's writings, to whom, however, they are most religiously credited. The young Earl has, moreover, more scientific knowledge than usually falls to the lot of the House of Peers, and if he makes no great discoveries, he does not at least make any of the glaring errors which are such a ludicrous feature in the works of the amateur explorer. His account of the Indians of the region, if not absolutely new, will be as good as new to most people. He is, however, in error when he thinks that the literature of American ethnology is scant. It is, on the contrary, more full, voluminous, and perfect than that of any other country in the semi-civilised world. The style of the book we have already indicated from the extracts given. The following quotation will not only serve as a good example of the rollicking humour of the author, but of the good-natured banter which runs through the work. The extract is from the preface in which he so cleverly satirizes the notoriously mythical adventures of some Alpine and other tourists :—

"I must apologise," he writes, "for the fact that nothing happened to me or to any of my party. But so far as I am personally concerned, it is useless to pretend that anything ever does happen to me. I never have an adventure worth a cent. Nobody ever scalps me. I don't get 'jumped' by highwaymen. It never occurs to a bear to hug me, and my very appearance inspires feelings of dismay or disgust in the breast of the puma or mountain lion. I am not drowned or overwhelmed by sudden floods. I don't slide down precipices and catch by the seat of my trousers on a spike just as I am falling over a cliff 40,000 feet high. I don't ride for my life, the whirling lasso of a wild Comanche just grazing my shoulder; so I have no opportunity of describing my mettlesome steed, 'swift son of the desert or the simoon.' My dog has never caught me by the coat collar just as I was sinking for the last time; so I have no excuse for making poetry (if I could), and shedding a few tears over the faithful companion of my wanderings, lately deceased. Savages never throw tomahawks at me, or stick my best hat full of arrows. It is true that I have been often horribly frightened, but generally without any adequate cause, and I have suffered fearfully from a too liberal admixture of saleratus in my bread, and terrible things happened to me in consequence, but only in my dreams. I don't get lost for weeks and half starved—neither buffaloes gore me nor wapiti spike me with their antlers. If I drew upon my imagination the draft would probably be returned with 'no effects' written across the face of it, or if there was any value to be found some officious person would surely disclose that the notes were forgeries or the coin counterfeit. So the reader must reconcile himself or herself to find in the following pages nothing more than a simple but truthful description of an ordinary humdrum trip."

We might add that the local colouring might have been quite intense enough without quite so much profanity as so plentifully bestrews the noble Earl's pages. However, we suppose that oaths are as necessary to the proper portraiture of a "western man," as is a nasal drawl to a stage Yankee. The work is illustrated by some good woodcuts and useful maps. Altogether Lord Dunraven has written one of the most charming books of the season.

R. B.

———:o:———

DISCOVERIES AND SURVEYS IN NEW GUINEA AND THE D'ENTRECASTEAUX ISLANDS. By *Captain John Moresby, R.N.* (Murray, 1876.)

H.M.S. 'Basilisk,' under Captain Moresby, did most valuable service in completing the survey of the south-east end of New Guinea. She has found a safe ship channel through the great Louisiade reefs, and has thus opened a highway for commerce between Australia and China; and has placed on the chart more than 140 islands and islets, of which twenty-five are inhabited, besides adding many excellent harbours and safe anchorages to our knowledge. Of the eastern end of New Guinea the northern side was previously unknown for a length of 190 miles, where the work of D'Entrecasteaux commences. On the southern side the coast had only been seen at a distance by Captain Owen Stanley. The reason that this coast had not been previously approached is the danger apprehended from the extensive coral barrier of the Louisiade reef, round which vessels beat to windward rather than seek a passage through it.

Captain Moresby has completed the survey of New Guinea by connecting the work of Owen Stanley, on the south, with that of D'Entrecasteaux and others on the north; thus making very important geographical discoveries. In our number for December 1873 (facing page 361) will be found a map of the eastern extremity of New Guinea and the islands off it, showing the principal portion of Captain Moresby's work; and there is an account of the discoveries made in 1873, at page 392. At page 13 of our number for January 1875, there is a notice of the exploring work done during the second visit in 1874; and Captain Moresby's paper, giving a full account of his useful labours in 1874, in which he was ably assisted by the officers of the 'Basilisk,' and by Lieutenant Dawson, is printed at page 119 of our number for April 1875. Captain Moresby has now published the results of his explorations during 1873 and 1874 in a pleasantly written and well-illustrated volume. His discoveries will thus, while being made generally known, be permanently placed on record in an accessible form.

———:o:———

FROM THE HEBRIDES TO THE HIMALAYAS. By *Constance F. Gordon Cumming*. London (Sampson Low.) 2 vols. 1876.

THESE two volumes treat of travels in Western Scotland and Northern India, one volume being devoted to each of these very dissimilar regions. The alarming increase of those who regard it as their mission to write a book of travels round the globe, besides recent events, have combined to make English readers familiar with the regular tourists' sights of India. The *Himalayas* volume of Miss Gordon Cumming's work will not, we venture to prophesy, prove so generally attractive as that in which she narrates her wanderings among the romantic scenery of West Scotland and its rock-bound islands. Miss Cumming has an exceedingly pleasant style, and this joined to a real poetic feeling enables her to do full justice to the legends, tales, and quaint customs with which each of these Western isles are so bound up. We heartily recommend these volumes as charming reading for leisure hours.

Log Book.

—:o:—

Letters for the Arctic Expedition.—It is Captain Allen Young's present intention to leave Portsmouth in the 'Pandora' on May 25th. Letters and parcels for the Arctic Expedition should be sent through the Post Office in good time, directed per 'Pandora.'

Colonel Gordon.—A letter has been received from Colonel Gordon, dated on the 3rd of February, at Fatiko; where he was, on his return from Mruli, to which place he had been with a small force. He had sent troops to Masindi, under Aufuma the son of Fowarka, and Kabba Regá fled on hearing of Gordon's arrival at Toweria. Gordon also had troops on the shore of Victoria Nyanza, as well as at Baker's Magungo. In two months a steamer and three large boats will be completed and afloat on the Albert Nyanza. Colonel Gordon intended to return home next October.

The Exhibition of Maps and Geographical Instruments at South Kensington.—This exhibition in the galleries at South Kensington is to be opened on the 1st of May, and the portion which is devoted to geographical instruments and maps will be exceedingly instructive, not only to experts and students, but to every one who takes an intelligent interest in geography and kindred pursuits.

The instruments will be on the ground-floor. First in importance are those lent by the Ordnance Survey, including Colby's compensation bars, with which the two base lines, one on Salisbury Plain and the other at Lough Foyle, were measured; Ramsden's theodolite, first used in 1792, and which has since been used at a vast number of stations, including the highest mountains in England, Scotland, the Hebrides, Orkneys, and Shetland; Ramsden's smaller theodolite; the theodolites by Troughton and Simms; Airy's zenith sector; and the "standard toise," a bar of cast steel used to connect the surveys of several European countries with that of England, and consequently taking a place of the utmost importance in the determination of the figure of the earth. There are also photographs of those magnificent instruments designed by Colonel Strange, which are now in India, for the use of the Great Trigonometrical Survey.* The Admiralty exhibit the instruments which comprise the ordinary outfit of one of Her Majesty's ships employed on surveying service. They include azimuth and altitude instruments, theodolite, sextants and artificial horizons, micrometer telescope, heliostat, station pointer, protractors, and scales. There is also a complete series of deep-sea sounding gear, commencing with the clam invented by Sir John Ross in 1818, and showing the successive inventions—Brooke's rod, the Bulldog clam, the Hydra and Baillie weight-detaching apparatus, Massey's self-registering sounding-machine, specimens of sounding lines, and the thermometers and apparatus for procuring sea water at great depths. The Kew Committee of the Royal Society exhibit the pendulum apparatus used by Captain Basevi in India; and that used by Sir Edward Sabine, which is similar to that with which Lieutenants Beaumont and Rawson of H.M.S. 'Discovery' will observe in the Arctic Regions.

* See our number for April, p. 99.

Among curious early instruments there will be the astrolabe constructed for Sir Francis Drake, an astronomical circle of 1572, and an azimuth quadrant constructed by Uletz in 1700.

The maps will be in the Upper Gallery. The Ordnance Survey exhibits mounted maps of part of Scotland, of part of Hampshire, of London and other large towns, and of Jerusalem; and portfolios containing specimens of maps of the cadastral survey, and the surveys of Sinai and Jerusalem. The Palestine Exploration Fund furnish a series of maps; and the Admiralty show the original manuscript by Dampier, of his voyage to New Guinea in 1700; and the original logs of Cook, Bligh, and Parry.

One side of the large Conference Room, 100 feet long, is devoted to maps of India, and of the Arctic and Antarctic Regions. The Indian maps are selected with the design of conveying an idea of the progress of cartography from the early Portuguese and Dutch plans to the latest results of recent surveys. Here will be shown the map of the Punjab Salt Range from Colonel Robinson's survey, which is the finest specimen of Mr. Walker's lithography; and a series of other Indian maps and charts, including those prepared to illustrate special subjects for the *Moral and Material Progress Report of* 1872-73.

On the Arctic side the maps will be grouped round the two handsome diagrams of the Arctic and Antarctic Regions by Captain Davis. They will be arranged to illustrate the progress of discovery from the days of Bylot and Baffin to those of Nares and Albert Markham; and among them will be several priceless manuscripts, shown under glass cases.

In addition to the catalogues there will be a handbook containing introductory notes on the different branches of the Exhibition. The Note on geographical instruments gives a sketch of the progressive improvements from the days of cross staffs and astrolabes to those of rigorously exact appliances required for the trigonometrical surveys. The Note on the study of geography by means of a series of maps, furnishes some account of the progress of cartography with reference to the requirements of the various countries and regions to be mapped; and enumerates the different classes of enquirers to whom maps are a necessary aid. The handbook further contains special Notes on the Arctic maps as illustrating the progress of discovery, and on the cartography of British India.

There will also be an exhibition of maps illustrating the surveys of France, Prussia, Russia, and other foreign countries.

To geographers the forthcoming Exhibition will be one of extraordinary interest. We understand that, during three weeks, there will be conferences at which papers will be read, arranged on the plan of the sectional work of the British Association, and that at least one day will be devoted to geography.

The German and Swedish Expeditions to Siberia.—Drs. Finsch and Brehm and Count Waldburg Zeil* arrived at Moscow on the 17th March, and there procured the services of a thoroughly competent interpreter, who was well acquainted with both Russian and German, and a servant. Nijni Novgorod

* See *Geographical Magazine* for March, p. 77.

was reached on the 18th, and thence they set out for Kasan in four sledges and eleven horses. Unfortunately travelling along the Volga was impossible as there were two feet of water on the ice there, so the travellers proceeded by the land route, which, through the spring having set in so soon, was execrable. On the 24th the party entered Kasan, and here they had an opportunity of seeing a good deal of Tatar life. Here also they met Dr. Radloff, who had travelled in the Altai and who showed them great hospitality. From Kasan they made for Perm in three light open sledges, and thence along a better road for Ekaterinburg and Tiumen, the authorities having telegraphed forward to the various stations to have horses in readiness and to help the expedition on their road. Latest advices state that the expedition had reached Ekaterinburg on the 5th April, and after having been warmly received there by the agents of the Russian Commercial Company, and made a two days' stay, set out for Tiumen.

Regarding Dr. Nordenskiold's plans for following up his voyage of last summer from Norway to Siberia, we learn that on the 7th of July next, he purposes setting out from Gothenburg in a steamer capable of taking 10,000 *puds* weight of cargo, and proceeding up the Yenisei to Dudinko, the lowest station visited by the Russian steamboat service on that river. Here he will take in cargo and return by the same route to Norway. The Russians on their part propose despatching a vessel from Yeniseisk down the river by way of the Sea of Kara and the North Sea to St. Petersburg. The Society for the Encouragement of Russian Sea Trade have also commissioned Messrs. Dahl and Randsen, two experienced seamen, to make a detailed survey of the Obi Gulf and estuary.

The Seal Fishery.—The Dundee fleet has returned from the seal fishing ground at the edge of the ice, with the following take:—

	Tons.	
'Esquimaux' (Yule) ...	110	2600 old, and 4000 young seals.
'Polynia' (Kilgour) ...	90	2100 old, and 6675 young seals.
'Erik' (Walker) ...	70	
'Nova Zembla' (Loffleys)	55	
'Jan Mayen' (Deuchars)	65	
'Camperdown (Gravill)	30	
'Intrepid' (Souther) ...	10	
'Narwhal' (McLennan)	10	
'Victor' (Nicoll) ...	10	
'Ravenscraig' (Bannermann)	0	

The 'Esquimaux' left Lerwick on the 13th, and reached the ice on the 21st of April, finding the patch of seals on the 30th, in about 73° N. and 4° W. The patch was very large, but a number of Norwegian steamers had already begun the fishing. The 'Polynia' got her seals between the 1st and 6th of April. The 'Eclipse,' 'Hope,' and 'Mazanthien' of Peterhead are all clean. The 'Labrador' of Peterhead, secured a few seals. Very heavy gales were experienced from the north-east, with intense frost. The 'Arctic,' commanded by Captain Adams, went this year to the Newfoundland fishery.

Retirement of the Lhasa Pundit.—The names of the geographical explorers despatched into Central Asia by Colonel Montgomerie are, for obvious reasons, kept secret. One is known as the Pundit, another as the Mirza, another as the Havildar, another as No. 9. The Pundit has been the most successful, and has made the most important explorations. An account of his very interesting journeys to Lhasa, and to the Thok-Jalung gold-fields will be found in the introduction to the *Narrative of the Mission of George Bogle to Tibet* (pp. cix. to cxiv.). In recognition of the important services rendered to geography in the former journey, which resulted in much valuable work and many observations, the Pundit received a gold watch from the Royal Geographical Society. In 1875 he completed a still more remarkable journey from Yarkand, across Tibet, and into Assam by the Tawang pass. Owing to some deplorable delay, which is not due to Colonel Walker, who had completed his Report many months ago, the account of this most interesting journey has not yet reached England. The Pundit is now about to retire from the service, and there is no longer any reason for concealing his name. It is PUNDIT NAIN SINGH.

Chinchona Cultivation in the Madras Presidency.—There are now 2,665,511 chinchona trees on the Government plantations in the Nilgiri Hills, the height of the tallest being 34 feet, with a girth near the ground of 28½ inches. The number of plants issued to private cultivators is 33,000, and the quantity of seeds 510 ounces. The harvest of Government chinchona bark, on the Nilgiri Hills, for the year 1875, was 65,200 pounds, worth about 6700*l*. The whole yield of chinchona bark from the Madras Presidency is about double that amount; 130,000 pounds having been brought into the London market between April 1875, and April 1876

Correspondence.

:o:

THE ARALO-CASPIAN DEPRESSION.

To the Editor of the "GEOGRAPHICAL MAGAZINE."

SIR,—Allow me space for a few remarks on the following passage from *L'Année Géographique* for 1875, a publication which, to the great regret of all its readers, we are informed, will no longer be edited by the eminent M. Vivien St. Martin.

Regarding Lake Aral, I find on page 207, this notice: "Un fait a été constaté, qui semble avoir une signification importante pour l'histoire hydrographique du lac d'Aral. Il a été reconnu que, dans le cours de ces dernières années, la côte orientale avait éprouvé des changements considérables, par suite de l'abaissement et de la retraite des eaux. Des baies qui s'enfonçaient fort avant dans les terres sont aujourd'hui desséchées; des bancs de sable sont devenus des îles, des îles se sont transformées en péninsules. Les anciennes limites de la côte se laissent parfaitement reconnaître. Des spéculations peut-être un peu hâtives ont déjà vu dans ce fait l'indice d'un rétrécissement graduel du lac; il pourrait tout aussi bien n'y avoir là qu'un de ces mouvements ondulatoires dont on trouve de nombreux exemples sur bien d'autres points de la surface terrestre. L'immense plaine de sables qui s'étend aujourd'hui sous le nom de Kizil-Koum 'les sables rouges,' entre le Jaxarte et l'Oxus, depuis la Boukharie jusqu'aux steppes kirghizes, n'est évidemment, dit on, que le fond desséché d'un ancien lac; et l'on rappelle aussi l'antique extension de la Caspienne vers le nord. Tout cela est possible, certain même, si l'on veut; *mais ces faits appartiennent aux époques géologiques de l'histoire du globe, bien antérieures à l'histoire humaine. Nous sommes là non seulement en dehors du domaine de la géographie*

actuelle, mais aussi, sans aucune doute, du domaine de la géographie historique."

In the absence of some precise explanation of the undulatory movement referred to by Monsieur Vivien St. Martin, I must most strongly object to the proposition contained in the concluding lines of the above passage, which I have placed in italics. They contain, I would submit, precisely the same misapprehension as that indicated for the consideration of your readers in my remarks on Professor Barbot de Marny's geological exploration of the Amú Darya district, which appeared in the *Geographical Magazine* for December 1875. In the letter alluded to, I showed how, without questioning the existence of a great sea covering North-Western Asia in later geological times, there is ample evidence of a subsequent Aralo-Caspian Sea, that undoubtedly existed in more recent times. This latter sea, the Caspian of history, there are very strong reasons for asserting, could, at the present date, be once more reformed, were it not for the changes of direction that the rivers formerly feeding it have undergone, and for the consequent diminution of their original volumes. With one exception, viz., the ground separating the basin of Aral on the north from the sources of the Ubagan and Tobol—the now ascertained heights of the Aralo-Caspian depression above mean sea-level, prove that no movement or upheaval has taken place in these regions; while, as to the excepted locality, there is every reason for thinking that its absolute height will eventually be found to add a final argument to those already in our possession. The ground then, it may be said, is there unchanged from the remotest antiquity; the water alone is wanting that formerly filled the basins and flooded the intervening marshes which formed a part of the Caspian of the ancients; while the disappearance of this water can be satisfactorily accounted for. So far, therefore, from straying beyond the domain of actual or even of historical geography, as Monsieur Vivien St. Martin suggests, we are, in fact, brought by a consideration of the phenomena of desiccation observed in Lake Aral, to the causes of the separation of this basin from that of the Caspian.

Some of these causes have already been submitted to the notice of geographers in a paper published in the *Journal R.G.S.* for 1875, and the explanation has been developed and extended in a more recently published work. In this place, therefore, no further space need be taken up regarding the subject, though it is by no means implied that the physical geography of North-Western Asia has yet been disposed of thoroughly and satisfactorily. On the contrary, there is a wide field open to the studies of many labourers, and among such the aid of Mr. Howorth will certainly be welcome. Most of the points touched upon in his suggestive letter on the Aral and Caspian basins, that appeared in the *Geographical Magazine* for April, have been treated in the pages of *The Shores of Lake Aral;* but I would wish here to say, Mr. Howorth's remark, that the places north of Kunya Urgenj bear names derived from Uzbek tribes, is a very judicious one, and points to the probability of the southern shore of Aral having been settled subsequent to the dispersion of the Golden Horde of Kipchak, as well perhaps to the locality having been previously covered by the waters of the lake. I must, however, disclaim anything but a most limited possession of the ethnographic attainments for which he himself is well known and which are necessary to a thorough solution of the various problems connected with Turkistan.

I will add one word more on the Kizil-Kum desert, referred to in the passage from *L'Année Géographique*, that opens this letter. The allusion to this great tract having formerly been the bed of an ancient sea is, I presume, prompted by Dr. Sévertsoff's study of the country east of Aral. Not having had the advantage of seeing the last paper written by the talented Russian *savant* on this subject, and having had but a limited opportunity of observing the Kizil-Kum myself, what follows can be little more than speculation, though it is speculation founded on physical aspects obtaining elsewhere near Aral, and which I have examined more closely, and are precisely similar to those attaching to some parts of the Kizil-Kum.

The more northerly portion of these immense sandy plains may, previous to their cultivation in recent times, have been at an earlier historical date the bed of a marsh, that was fed by the overflow of Lake Balkash, as well as by the surplus waters of Lake Issyk-kul. Both of these lakes are known to have previously had a much higher level than they now possess; and just as there are very strong grounds for thinking that the Aral and Caspian basins could once more be united, in a single waterspread, so it seems probable the north part of the Kizil-Kum might be reconverted into a marsh, that would be covered by dense growths of rushes (*Arundo*), the characteristic vegetation of the Aralo-Caspian depression. It is a sufficient supply of water alone that is wanting in order to restore the ancient Caspian Sea, as well, probably, as those appearances which I believe Dr. Sévertsoff is of opinion, were presented by the Kizil-Kum in times of antiquity.

Though, therefore, this great desert was doubtless the bed of a sea in a recent geological epoch, it appears to have been also the bed of a marsh in early historical times; and its surface, precisely in the same way as the lower ground lying between the Aral and Caspian basins may have been alternately wet or dry according as the levels of Balkash and Issyk-kul fluctuated, and in conformity with the consequent intermittent discharge of their waters. Here again, therefore, the causes of desiccation would be contemporaneous with human epochs, rather than with geological ones, and would thus be legitimately included in the physical geography rather than in the geology of these countries.

The question of the true history of the Aralo-Caspian depression is, I submit, a more important one practically than it may appear to be at first sight. At the present moment, with a French, as well as an English project under consideration for inundating the low lying sandy tracts of Northern Africa, and in the first flush of the gallant Cameron's triumphs among the great lakes and rivers, situated to the south of these deserts, it seems very probable, much knowledge is attainable from a thorough study of West Turkistan, that might be of infinite value when applied to the problems which are involved in the present state of the Great Sahara.

Yours, &c., HERBERT WOOD.

———: o :———

ANCIENT VIEW OF CONSTANTINOPLE.

To the Editor of the "GEOGRAPHICAL MAGAZINE."

SIR,—The University library at Leiden recovered some time ago an interesting view of Constantinople, drawn in 1559, by Melchion Lorichs, a native of Flensborg, and a very able artist, who accompanied Auger Ghislain Busbecq on his embassy from Vienna to Constantinople. This view consists of twenty-one sheets, together about ten meters broad and 0.43 high. It is drawn with the pen, and taken from Galata or Pera. At the end of the sixteenth century it was already in possession of our library (see *Geo. Dousa, de itinere suo Constantinopolitano, Lugd. Bat.*, 1599, *p.* 25), but it appears to have been removed at a subsequent rebuilding, and now it has been found again, much damaged, in a garret in the town-hall. It has been restored with the utmost care by Mr. W. Pleyte, Conservator at the Museum of Antiquities.

One of the gentlemen of our library remembers to have read of an English scholar making investigations on the former topography of Constantinople. I doubt not you will do him a service in fixing his attention on this large and accurate view of the town.

Yours, &c., P. A. TIELE.

UNIVERSITY LIBRARY, LEIDEN,
February, 1876.

Proceedings of Geographical Societies.

—:o:—

ROYAL GEOGRAPHICAL SOCIETY.

Meeting of 13th March, 1876.

Sir Rutherford Alcock, Vice-President, took the chair at 8.30 P.M. The business of the evening consisted in the reading of two communications from New Guinea, the first of which was from the Rev. S. Macfarlane, dated Cape York, January 7th, 1876,

On the Ascent of the Fly River, New Guinea.

Starting from Cape York on the 29th November last, on a missionary cruise, accompanied by Lieutenant Chester and Signor d'Albertis, and after calling at some stations in the Straits and the adjacent coast of New Guinea, Mr. Macfarlane and his party started for the Fly River, taking with them the chiefs of Katau and Turituri, two villages on the mainland, the people of which are on friendly terms with those at the mouth of the river. Five minutes after leaving Katau they grounded on a bank, which it was impossible to see, owing to the muddy state of the water, but the rising tide floated them off in less than half an hour. They then steered for the passage through the Warrior Reef, but found it narrow and intricate. Mainou, the Katau chief, informed them there was a better passage nearer the mainland, although not marked on the chart, so that course was at once taken. The calmness of the weather allowed them to get near Bampton and Bristow Islands on the evening of the 5th of December and the following morning they made for the mouth of the river, and had some difficulty in finding 8 feet of water to float in. Nearing the mouth deeper water was found, and when fairly in they got 5 fathoms.

At the mouth of the river, on the eastern side, there are two villages, some of the houses being from 300 to 400 feet long. The people are represented as being very numerous, and great warriors. The river is about 5 miles wide, and widens a little about 10 miles up, but 20 miles from the mouth it is difficult to say what the width is. A large opening was found to the eastward, which may be another mouth of the Fly, and there appeared to be openings to the north.

The first night they anchored off a small island, about 16 miles from the entrance of the river. Before reaching it, however, the water was found to be very shallow, and the vessel grounded, but was soon off again with the rising tide. Soundings were taken on both sides, the channel found, and they anchored in 2 fathoms of water. Shortly after two canoes hove in sight under sail, apparently coming from the two villages, followed soon afterwards by five others, with five or six men in each, who were waving green boughs as a sign of peace, but the strong tide prevented them coming near. Next morning five more canoes appeared, with about six men in each, who showed their confidence by coming on board, and giving their yams for whatever was offered them. They were astonished at all they saw, and pleased with all they received. Two of the canoes were towed to the village, 3 miles up the river, the natives remaining on board, and laughing heartily at their friends, who were pulling hard to keep up with the ship. Shallow water was again found, barely enough (6½ feet) to keep them afloat.

Next morning, after steaming about 6 miles, five large canoes were seen, filled with armed men, putting off from an island ahead, which were shortly afterwards joined by four others, and containing from twenty-five to thirty men, two-thirds of whom were paddling, the remainder standing, bow and arrow in hand, ready for action. They were all in war costume, which consists of helmet, shield, and armlet, and some of them, doubtless the chiefs, had plumes of paradise-birds' feathers waving from their helmets. Maninou, the chief, shouted to them that they did not want to fight, at which they laughed mockingly, and asked why they had come to their land. The war party came on shouting and yelling, and nervously handled their bows and arrows. To have allowed them to approach would probably have proved fatal on both sides, their arrows being poisoned; a gun was therefore fired across the bows of the first canoe, which caused them to hesitate for a moment, but only for a moment, for they came on more furiously than before. Two more bullets were fired, which struck the bow of one of the canoes. Instantly they dropped their bows and arrows, seized their paddles, and pulled for dear life. For about 2 miles several natives were seen following on the banks.

The following day the vegetation on the banks of the river began to change in appearance. Here and there were patches of green grass, graceful palms of various kinds became more numerous; also the wild nutmeg, mango, and bread-fruit. No more natives were seen until they anchored off a small island, well wooded at one end, and abounding with the sago palm at the other, about 24 miles from where they were attacked. Here they stopped to cut wood, but had only been on shore an hour when three canoes full of armed men made their appearance. All hands were called on board, at the sight of which the natives seemed to hesitate, and after a consultation returned to their village, but soon after reappeared with reinforcements, shouting and yelling as they bore down on the 'Ellengowan.' A few shots caused them to sheer off round the island.

Next morning the 'Ellengowan' was off with the flood-tide, and was followed for a distance of about 12 miles by about twenty canoes, filled with armed natives, none of which approached nearer than 600 yards. From this point the river became narrower, and the banks better defined here and there, as in the Baxter, consisting of patches of red clay, 20 or 30 feet high. Having steamed 28 miles during the flood-tide, they were again startled by the yelling of natives, although neither village nor plantations could be seen. Early next morning more than 100 natives were seen assembled on the beautiful green bank of the river, but their object seemed rather to protect their homes than attack. No more natives were seen beyond this point, which seems to indicate that the natives met with had worked their way from the coast, and not from the interior.

Quite an archipelago of small beautiful islands was passed, covered with palms and creepers of various shades and forms, the latter hanging most gracefully from the trees in festoons, and trailing their delicate flowers and tendrils in the stream. Considerable difficulty was experienced in finding their way amongst these islands, after passing which the river again narrowed, and the stream became more rapid, and much deeper. On Saturday evening, December 11th, they anchored in 7 fathoms, and remained till Monday. Towards evening there was a little excitement on board by the supposed discovery of mountains; but the morning sun, however, dispelled the mountains, and left them in doubt and perplexity, as before. By sunset they were 150 miles from the mouth of the river, and coming to a sharp bend, where the river took a west direction, they anchored in 17 fathoms of water.

The following morning the captain, Mr. Chester, and the Rev. S. Macfarlane, penetrated the river 5 or 6 miles further, when two channels were found, occasioned by an island, which they named Ellengowan Island, and which they circumnavigated. The river was seen stretching away to the north-west, and the Rev. S. Macfarlane says it is probable they might have gone on 100 miles further before reaching mountainous country.

The return journey was commenced on the 15th of December. At the villages where they were attacked the second time on their way up the river, a fleet of canoes came out to meet them. Everything was done to entice them to come near the vessel, but without success. They continued following the vessel for 2 or

3 miles, and being near the shallows it was felt that any accident to the ship might encourage them to attack, a charge of dynamite was therefore thrown overboard, with a long fusee, allowing it to sink to the bottom, and them to approach it before exploding. At the shock, and the sight of the water bubbling around them, the natives appeared utterly bewildered, those standing in the canoes dropped as if they had been shot, and none of them ventured to pull another stroke towards the ship. It was as well their progress had been stopped, for in less than half an hour the 'Ellengowan' struck on a bank, and remained hard and fast. On examination it was found that the shaft was broken near the boss of the propeller. During the time occupied in getting the propeller off, the natives, who had been watching from the shore, had taken to their canoes, and paddled towards the ship. Succeeding in getting one of the canoes alongside, and after making some presents, and an assurance of friendly intentions, others came near. Knives and hatchets were shown them, and they were told that a boat would accompany them on shore to barter for figs, &c., at which they manifested great delight. Mr. Chester went in charge of the boat, surrounded by all the canoes. These were the people who attacked the 'Ellengowan' on her way up. The boat soon returned, laden with two pigs and some bananas. In the evening the vessel swung to her anchor, and soon after was kedged in three fathoms of water, where she anchored for the night. Next night they started with the tide, and the 27th found them again in port at Cape York.

The second communication was from Mr. Octavius C. Stone, dated Anuapata, New Guinea, 7th Dec. 1875,

ON HIS RECENT EXPLORATIONS IN THE INTERIOR OF NEW GUINEA, FROM PORT MORESBY.

With a party consisting of Mr. Hargraves, of Sydney, and Messrs. Broadbent and Pettard, well-known collectors and taxidermists, three trips were made inland; but owing to the impossibility of obtaining native carriers, and having been unable to procure any men in Somerset, all idea of crossing the peninsula had to be reluctantly given up. The first trip was to the River Laroki, which they came upon by travelling 9 miles in a N.N.E. direction, and found falls into the sea at Manumanu—there called the Manumanu River (the Lily of Captain Moresby),—and which, at that season of the year, was 25 yards wide and 6 feet deep, although its natural banks are 50 yards between, and after severe rains it must be swollen to double its present depth, running now at the rate of 4 miles an hour. It runs between a belt of tall trees, and abounds with alligators, while the tracks of pigs and cassowaries upon its mud-shores are not uncommon. Birds of many species are very plentiful in its neighbourhood. The second trip was to the villages of Omani, Ipakari, and Muninim, situated beneath the shade of Mount Astrolabe, and from which the Laroki receives part of its supply, running as it does between that and the precipitous Vetura Range to the north, and thence in a northerly direction to its first sources among the higher mountains. The natives say another branch of this river falls into the sea at Karo, near the Hula (Hood Point).

At Omani and Ipikari the travellers were hospitably received. Wishing to remain the night and ascend Mount Astrolabe on the morrow, they were besought to leave, and being loth to cause any ill feeling, they marched the same evening to Muninim, 2 miles distant. Excepting in the valleys, the land is poor, and strewn with pieces of broken rocks and stones; and, though better than in the immediate vicinity of Anuapata Harbour (Port Moresby), possesses, nevertheless, insufficient inducements as cultivable land.

Crossing the Laroki on a raft, 3 miles further east than the point where they had first seen it, they shortly afterwards arrived at the temporarily-deserted village of Momili, 12 miles distant, where the night was passed, the inhabitants having left on account of the insufficiency of food, and had gone further inland. A rivulet, 15 yards wide, rising north of the Vetura Range, flows immediately behind the village, and empties itself further west into the Laroki. This rivulet they crossed five times on the following day, although in returning it was found only necessary to cross it once in going to Keninimu, 7 miles further. The country now commences to be watered by numerous mountain-streams that intersect it in every direction, and help to fertilize it. Several large tracts of level land, with rich alluvial soil, were passed after crossing the Laroki, and these are either quite free, or comparatively free, from any particle of rocky matter. But at Keninimu the nature of the country may be said to change entirely, for the open forest land of gum-trees gives way to mountains covered with scrub and lofty trees that continue to and even clothe Mount Owen Stanley, or *Birika*, as the highest point is called by the aborigines of the interior. The constant rains among these more distant hills fertilize the entire area, commencing from Keninimu, and the vegetation becomes tropical to a degree. Indeed, no soil or climate could be better suited for the cultivation of sugar-cane, coffee, rice, Indian corn, tobacco, and vegetables.

Three distinct tribes were found inhabiting this part of the peninsula, namely, the Motu, the Koitapu, and the Koiari. These savages were found most inoffensive and friendly disposed, and, as far as learnt, not given to cannibalism, thus differing from the pure Papuan. Their manner was jovial, differing materially from the sullen and apathetic character of the pure Malay, and were much darker skinned with frizzy hair. Their greatest resemblance appears to be in the construction of the language.

Farunumo, 3 miles further than Keninimu, was the most distant point reached on December 9th, which is situated 20 miles in a direct line due north-east of Annuapata. Returning a mile they camped close to the village of Matogorogoro, and during the three days they remained there were visited by the chiefs and inhabitants of both villages, as well as by those from more distant places.

It is devoutly to be hoped that no kidnapping parties will be allowed to bring their curse upon these people, who up to the present time have no cause for ill feeling against the white man, but rather one of friendship, which ought to be cultivated while there is a chance, and before the indiscretion of meddling strangers involves the life of future travellers.

The CHAIRMAN observed that the picture presented by Mr. Stone was a very pleasant one, because it described a race who were neither intent upon killing nor upon eating white men. The people seemed to be of a much gentler and more peaceable disposition than those Mr. Macfarlane had met with further west. He did not know how far Mr. Stone's theory was correct—that the people on the Eastern Peninsula were less hostile because they were well fed; but there could be no doubt that people who had plenty to eat, and were comfortably situated, were generally more placable than those who were starving. The most alarming mobs that ever existed in civilized countries had been mobs caused by famine, which seemed to act with a peculiar insane power of excitement; and therefore a perpetual state of plenty might beget a peaceful disposition.

Meeting of March 27th, 1876.

SIR HENRY RAWLINSON took the chair at 8.30 P.M. The paper of the evening was by Captain Anderson,

ON THE NORTH AMERICAN BOUNDARY FROM THE LAKE OF THE WOODS TO THE ROCKY MOUNTAINS.

In June of 1872 the North American Boundary Commission was organised under Major Cameron, R.A., and at the same time four Engineer officers and a detachment of Royal Engineers were selected to serve on the Commission. Leaving Liverpool on the 22nd of August they reached the frontier at Pombina on the 20th of

September, where they were joined by the Canadian contingent. The Commission appointed by the United States Government were also assembled at Red River ready to commence operations.

The position of the boundary line at Red River was determined by astronomical observations taken independently by the British and United States Commissions. Three astronomical parties were organised by the British Commission, one of them commencing work at an intermediate point between Red River and the Lake of the Woods, and the other two parties proceeded to the Lake of the Woods to commence operations there, in concert with the United States Commission.

From the north-west point of the Lake of the Woods the international boundary line follows a due south line for 26 miles to its intersection with the 49th parallel in the open water of the lake. For the first 16 miles it cuts off a promontory of the western shore of the bay, and then continues southerly for 10 miles across the open lake, and intersects the 49th parallel at a spot in the lake where the soundings through the ice gave a depth of 30 feet of water. Proceeding then due west for 6 miles, the boundary line intersects the western shore of the lake.

In order that the geographical position of the boundary lines should be accurately determined in latitude as well as longitude, advantage was taken of a line of telegraph connecting the Red River Settlement with the United States, to exchange telegraphic signals for the determination of the difference of longitude between the British Observatory camp at Red River and the United States Observatory at Chicago. Nine hundred miles of wire were placed in continuous circuit, and instantaneous comparisons of the local time at both ends were made on five successive nights, simultaneous with observations on the stars, for the determination of the local time at each place. In mid winter the insulation of the wire was perfect, and this long circuit of 900 miles was worked without difficulty, and the longitude of Red River Astronomical Station was determined with a probable error of less than 100 yards, with reference to the meridian of Chicago, which had previously been connected with Greenwich. This result will be of the greatest possible importance in the future, as it will be the starting-point of all future surveys in the central portion of the continent, where the accurate geographical positions of important points had hitherto been so little known, that the official maps showing the north-west point of the Lake of the Woods had an error of 4½ miles in longitude.

The fine alluvial prairie of the Red River Valley was found to extend for 35 miles to the westward, and there to be bounded by the first prairie steppe called Pembria Mountain. The boundary line, after passing through 8 miles of rough ground came upon the gorge of the Pembria River, which flows in a deep ravine 350 feet below the table-land, and 3 miles in width from summit to summit. After crossing this river, an ascent is made to the Upper Plateau and to the commencement of the Great Plains, which extend in one vast expanse, more or less broken, to the base of the Rocky Mountains, 700 miles distant.

Proceeding to the westward along the boundary-line, the first section of the Great Plains is found to be 70 miles in width. After crossing this plain, levelled in former ages by the great drift which has left huge bowlders of granite and limestone stranded in all directions, a curious elevated and thickly-wooded district occurs, extending for 34 miles along the boundary; and this feature, known as Turtle Mountain, commencing in United States territory, protrudes for 8 miles across the line into British territory, where the principal portion of the wood occurs, in consequence of the ground having a northern exposure. The boundary, in its course of 35 miles in Turtle Mountain, crossed sixty-five pieces of water, of which twenty-five are true lakes, with gravelly shores, necessitating a survey by triangulation instead of the ordinary method by direct chaining. The Great Plains continue beyond Turtle Mountain for 138 miles, at an average elevation of 2000 feet above the sea, and the only breaks that occur in the monotony of the scene are occasioned by the Souris River, which, in its meandering across the plain, has cut out a valley of varying width from 1 to 2 miles, and 150 feet below the plain. The general level of the plain is not disturbed for 120 miles west of Turtle Mountain, but a warning of some change in the character of the country is given by a low-lying ridge bounding the distant horizon to the westward, forming a coast-line to the land sea beneath it, and this feature, which becomes less and less defined as one approaches it, is the Great Coteau of the Missouri, and is one of the most important features of the western plains. It is the second prairie steppe of the North American continent, and crosses the country from north-west to south-east. This coteau, or prairie steppe, leads to a remarkable plateau of an average elevation of 2250 feet above the sea, and is broken up in a succession of ridges, valleys, and basins, presenting in section a very broken and irregular profile. The boundary-line for 50 miles crosses the great coteau district, and over the whole of this distance there is no well-defined ridge or water-course, but the same confused monotony of ridges and hollows. These are succeeded to the westward by a more undulating country, in which large alkaline lakes occur, and as the waters evaporate during the summer, a white saline deposit remains on the shore line. The chain of salt-lakes extends in almost an east and west direction for 15 miles, and over the whole of this district, including the Great Coteau, the waters have no outlet to the ocean. The soil, which is of clay and very friable, is unable to support vegetation, and this rugged and desolate country, which somewhat resembles the wilderness of Judæa, is called by the half-bred hunters "Les Mauvaises Terres." The principal portion of this semi-desert occurs on the United States side of the boundary-line; but a wedge-shaped area of bad lands and barren soil protrudes into British territory, measuring at its base on the boundary 7 degrees of longitude, and tapering off northwards to a point near the great elbow of the Sascatchewan, 125 miles north of the line.

Field operations were suspended during the winter of 1873-74; and early in the spring the whole force of the Commission marched thirty-two days' journey to the westward, and established a new base at Woody Mountain. For 100 miles the country was most rugged and inhospitable, and the only practicable route for the main line of communications lay 25 miles to the north. The formidable gorge of White Mead River could only be crossed by waggons at a point 16 miles north of the boundary, and this gauge crossed the boundary-line so obliquely, as to measure seven miles from summit to summit.

At a point 500 miles west of Red River, the boundary-line emerges from the most broken portion of the Bad Lands and enters upon an arid plain of sand, where there is a little soil, scarcely able to nourish a light sod, but a cactus plant flourished in great abundance. The buffalo was first met with here in great herds.

This arid cactus plain extends for 50 miles from east to west, and is bounded on the west by the remarkable gorge of the Milk River, which crosses the boundary-line very obliquely. This gorge was explored for 50 miles of its course, before a crossing place for waggons could be found, the banks of the valleys being in most places nearly perpendicular, and 300 feet in height. The river itself is very insignificant, and at the fording-place, where the current was running rapidly on the 10th July, the stream had completely disappeared in the sand a fortnight later, and the water had shrunk into brackish pools.

The most prominent feature of the western plains are the Three Buttes, or Sweet Grass Hills, and are first visible from a point on the boundary 100 miles distant to

the eastward. On passing round the northern slope of the eastern Butte, the summit of which is 6 miles south of the line, the plain was much broken and intersected by ravines and ridges, and some difficulty was experienced in finding a practical route to the westward for the heavy waggon-trains. The country to the westward of the Buttes consists of a gravelly undulating plain, in which the water-parting occurs between the northern and southern systems of waters. At St. Mary's River a mountain stream was found flowing northward boisterously in a channel full of bowlders and shingle.

After crossing St. Mary's River the boundary line enters the Fertile Belt, which extends for 25 miles to the base of the Rocky Mountains. The barrier of these mountains rises abruptly from the Plain to precipitous peaks 10,000 feet above the sea. The horizontal strata of the plains are suddenly broken by the crumpled rocks of the mountains elevated by some great convulsion of nature to the altitude of 5000 feet above the plain; the limestone beds on the peaks and ridges weathering into the most bold and rugged outline, while underneath are the sandstone beds of variegated colours. In a cleft in the heart of the mountains Waterlin or Chief Mountain Lake is enclosed, and by rafting in this lake access is obtained to the boundary line. The lake opens out northward to the plain, and at its northern extremity is the western limit to which wheeled vehicles can be taken. There is now no impediment whatever to driving a waggon from Red River due west across the plains for 800 miles to the foot of the Rocky Mountains.

The whole boundary from the Lake of the Woods to the Rocky Mountains is now marked by stone cairns or earthern mounds at three mile intervals across the great plains, and by iron pillars at mile intervals for 135 miles, marking the southern boundary of Manitoba, which is destined before many years to be the great granary of the dominion.

The PRESIDENT called the attentionof the meeting to the fact that the survey in which Captain Anderson had been engaged, over nearly 1000 miles of territory, had not been a mere labour of love, or even an exclusively scientific operation, but a great political arrangement. Defining a boundary between two great empires, like those of England and America, was a great step forward in the cause of civilization. It was necessary to preserve definite relations, both of territory and policy, between two conterminous powers, before trade could be developed and civilization prosper. Now that there was a definite line and definite pacific relations between the two countries, he trusted that trade would be developed and the resources of the country brought to market. As far as geography was concerned, it must be remembered that where a line such as the boundary-line had been once surveyed and definitely laid down, there was a direct basis for all future scientific operation. Surveys, using that line as their base, could be extended on either side until the whole country was as thoroughly surveyed as the regions of Europe. Of course, the line that had already been run through the country did not aspire to trigonometrical accuracy, but it served, at any rate, as a good practical line for future scientific operations.

Meeting of April 11th, 1876.

CAMERON'S JOURNEY ACROSS AFRICA.

THE meeting was held in St. James's Hall, H.R.H. the DUKE of EDINBURGH in the chair. Among those present, besides the Members of the Council, were Sir Alexander Milne, Sir George Back, Sir Harry Keppel, Admiral Hornby, Captain Lord Gilford, the Rev. Dr. Badger, Mr. Monteiro, Colonel Grant, and several members of Lieut. Cameron's family.

The Duke of EDINBURGH said, I have great pleasure on this occasion—the first occasion on which I have had the honour of occupying the chair since I became President of this Society—of presenting to you so distinguished a member of a profession to which I have the honour to belong, and a gentleman who has distinguished himself so much by the journey which he has accomplished—a journey from sea to sea through the centre of Africa. I feel that it requires very little preface on my part to introduce him to you. The remarks upon this interesting journey are to come from him, and any words that I might make would only take away from the interest with which I am sure you will listen to him in his account of his interesting exploits. At the same time I must congratulate the Navy that it should fall to the lot of a member of that profession to show that pluck which distinguishes all Englishmen, but which, in my opinion, more particularly distinguishes naval officers, and to accomplish so great a feat as the journey across the vast continent—a journey which occupied two years and eight months, and which, though the original object was to search for our late lamented explorer, Dr. Livingstone, eventually became a separate and independent exploration on Lieutenant Cameron's own part. I have great pleasure in introducing to you Lieutenant Cameron, and I do so in the confidence that we shall all be deeply interested by the account he will give us of his interesting journey.

Lieutenant CAMERON then commenced the reading of his paper. A description of his journey from the East Coast to Lake Tanganyika having already appeared in this journal,* we continue his progress from Kasengé.

After leaving Kasengé, Cameron went on to say, we first crossed the southern end of the mountains of Ugoma (although nominally in Uguhha), and many streams flowing south and south-west towards the Lukuga. At one place on our road we passed a hot spring, about which the vegetation was very luxuriant. Many frogs and other reptiles were living in it. The first country we passed was Uguhha; the people there are distinguished by the peculiar and tasteful manner in which they dress their hair, and the elaborate tattooing on the women's stomachs. We then passed through a number of small tribes, which form a sort of dividing line between the great empire of Urua, of which Uguhha is a part, and Manyéma, where every small village has an independent chief. From Uguhha we crossed the mountains of Bambarré, and on arriving at their foot, came into a completely new style of country. The huts were all built in long low streets, and rows of oil-palms were planted down the centre. In the gullies of the Bambarré Mountains are some of the most enormous trees that I have ever seen. The gullies are in many places from 100 to 150 feet deep. You can look down from the bank and see trees growing from the bottom of the gully, and up to their heads towering to an equal height above. We had now the full benefit on our marches of the grass of Manyéma, complained of by Dr. Livingstone. This grass grows in places to a height of 12 feet, and the stalks are thicker than one's finger. It is almost absolutely necessary to burn the grass in front of one, in order to be able to get along. The people of Manyéma are a very fine-looking race, but roughly armed with shields and heavy spears; they have no knowledge of bows and arrows. A great deal of iron is worked in the country, and they are expert smiths.

A few days after this we arrived at Kwakasongo, where I found an Arab settlement. The chief of this village is called Kasongo, but he must not be confounded with the great Kasongo chief of all Urua, being, in fact, simply the chief of one village, and by trade a working blacksmith. From Kwakasongo I went by land three marches to Kumbwi, on the Lualaba, and there, after a great deal of trouble, I obtained boats to take me and a few of my men on to Nyangwé by river, leaving the rest to follow the route on shore. A Nyangwé there is a large permanent settlement of Arabs and Wamerima. Here the bed of the river has a very rapid fall, and its current is very fast—from 3 to 4 knots opposite Nyangwé. I measured the width of

* See *Geog. Mag.* for August 1873, p. 199; January 1874, p. 416; March 1874, p. 488; January 1875, p. 1; March 1875, p. 71.

the river at this point with a sextant, and found it to be 1020 yards; in many places it is much wider. The depth opposite Nyangwé towards the end of the dry season is, on an average, over a fathom, with channels of 3 fathoms in depth. The river is full of crocodiles and hippopotami.

After having been detained at Nyangwé about three weeks, a party of Arabs came in from the south side of the river—where they had been fighting with the natives—bringing news that Tipo Tipo was coming up from his camp, in order to make peace between the Arabs at Nyangwé and King Russuma, a friend of his who had been attacked by the Arabs from Nyangwé. Tipo Tipo, whose Arab name is Hamed ibn Hamed, I may say, in passing, is the first Arab who reached the Lomâmi from the south-east. During the whole time I was at Nyangwé I was only able to get one small canoe. Tipo Tipo on his arrival told me that if I would come down with him to his camp, some eight marches south of Nyangwé, I should from there be able to find my way to a great lake, into which the Lualaba fell.

When I reached his camp, I found that the chief on the opposite side of the Lomâmi refused to let me pass, saying that no caravan had ever been through his country, and if anybody tried to pass, he would fight them. When at Tipo Tipo's camp I heard of a lake called Iki, which I believe is the Lake Chebungo, or Lincoln, of Livingstone, which is a little to the west of the Lomâmi, and on the Lawembi. I met many people who had been across to the great lake of Lankorra. According to their accounts, this lake was from ten to fifteen days' journey off, the discrepancy in time arising from the different lengths of the day's marches. Here I saw cloth and other stores, which had been brought across from the lake by the native traders, who also reported that on this lake there were men who wore trousers and hats, had very large boats, capable of holding from 180 to 200 men, with masts and sails, and on which they had fires for the purpose of cooking their food. These at the time I supposed to be Portuguese Pombeiros from Kassanci, or perhaps white Portuguese. On the refusal of the chief to the west of the Lomâmi to allow me to pass, I began to inquire what course I should adopt in order to get to the Great Lake, and was told that if I went down to the capital of Kasongo, I should there find Portuguese traders, in evidence of which I was shown a Portuguese soldier's coat, which had come from near that place, having been brought there by a trader from Bihé. After a few days Tipo Tipo gave me three guides, natives of Urua, to show me the road to Kasongo's capital. There is yet another Kasongo, who is chief of the district where Tipo Tipo is settled, and who is comparatively powerful, but at the same time he and nearly all the chiefs of the south of Lualaba pay tribute to the great Kasongo of Urua. Leaving Tipo Tipo's, we went nearly south, going close along the right bank of the Lomâmi. At many places the people were friendly; but in others so many reports had come that no caravans came near there for any other purpose than getting slaves, that the villages were deserted, and we were often in difficulties about food. Down to 6° 10′ S. we were constantly crossing small affluents of the Lomâmi, and from time to time having glimpses of the river itself. Here we crossed one of two branches into which it splits, forming a sort of island. As we were passing through a strip of jungle some people commenced shooting at us, and an arrow glanced off my leather coat. I ran this man down and gave him a thrashing, but would not allow anyone to fire in return, and walked straight up to some people who were in front of us; we tried to make a palaver, in which, after a time, we were successful, and we went on with the natives as the best of friends. From there we crossed this branch of the Lomâmi called the Lukazi again, and passing down south through villages and jungle alternately, till we arrived at a place called Kanowani.

Next morning, as we were packing up for the road, I missed my pet goat, Dinah, and asking where she was, I was told that she slept outside the camp. I went to look for her, and walked up into the village to ask about her; and so little did I suspect any harm that I had no gun or pistol with me, and the man who accompanied me was also entirely unarmed. When we made inquiries about the goat the natives began shooting at us. Some of my men ran up and brought me my rifle and pistol, and the remainder packed up all our stores and came into the village. For a long time I would not allow my people to fire. At last, as the natives were closing in, and a large body of from 400 to 500 men came up from the road which we had intended to go, I at last allowed two or three shots to be fired, and I believe one of the natives was then shot through the leg. After this we commenced a parley, and it was proposed that my goat should be returned, and that one of my men should make brothers with the chief, and that we should exchange presents and be good friends. While that was going on, another large party came in, headed by a chief, who told the people of the village that they should not be such fools as to make peace with us, as we were a very small caravan, and they would be able to kill or make slaves of the whole of us, and share our beads and stores amongst them. When they arrived the people again began shooting at us. I would not allow my men to fire, for fear of breaking off the negotiation, until the men closed in, throwing their spears at us. I then fired two or three shots close to some of the natives, set fire to one of the huts in the place, and told the chief that if he did not take his men off, I would burn the village down; they had already burned our camp. On this he said, that if we left the village we could go unmolested. So the guides that I had got from Tipo Tipo said, that if we went off some ten or twelve miles, to another village to the eastward, we should find people that were friendly towards us. At sunset we arrived close to a village called Kamatété (which I afterwards re-named Fort Dinah, in memory of the goat), and I told the guide to say that we wanted to be friends and to camp there; their only answer was a volley of arrows. As we were unable to stop out in the night in the jungle, with all these fellows round us, I called out to my men to follow me and storm the village. Four men followed me; the rest, except one or two men, with Bombay, who was told to look after the stores, ran away. Luckily the natives ran the other way. When we got into the village I burned all the huts down but four, and my men coming up, set to work to make a fortification. Here we remained five days. We were being constantly shot at, and some men wounded. We were fortunately close to water and plantations of cassava, so that we were well supplied with food and drink. The guide told me we must shoot some of the natives before we could get out of our prison; and at last I was forced to use my gun. The report of my heavy rifle they soon learned to respect. At the end of five days we made peace, they having been funked by some of their people being killed and wounded. The natives, after the fight was over, offered an indemnity, which, however, I did not accept, but we exchanged presents as a token of friendship.

On arriving at Kowedi, six or seven hours' march from the lake, I found my passage barred by a chief, who said he had orders to allow no one to pass the Lovio, which was between us and the lake, as a brother of Kasongo, called Dariji, who was up in arms against him, was living with a chief there; but that Kasongo was near, and if I sent to him I should, perhaps, be able to get leave. However, I was able to send men across to the lake, and they brought back news that the lake was very large, but very much encumbered with floating vegetation, on which the people laid trees, and on them again spread earth and built their huts, and grew provisions on these floating islands, which they cut adrift from the main mass, and at times they used to

shift about from one portion of the lake to another. This Lake Kassali, or Ke Konja, was also remarkably full of fish: and I believe one of the reasons why I was not allowed to go there, in addition to the orders of Kasongo, was, that the fetish-men of the chief said that if I saw the lake it would dry up, and that they would loose all the fish on which they, in a great measure, depended for their sustenance. The result of these various interruptions was, that I had to content myself with a distant view of the lake.

The fourth section of the journey was from Kasongo's capital to the West Coast at Benguéla. We first crossed the Lovoi, and then nearly along a water-shed between rivers running to Lualaba above Karsali, in a south-easterly direction, and those joining the same stream in a lower part of its course, but running nearly north. After that we passed nearly along the water-shed between the Zambesi and the Congo, until we arrived in the basin of the Kwanga.

At the first camp we were delayed by people going to look for their runaway slaves. The next morning, when I was ready to start, a message came, "No march; Kwarumba is coming up with his slaves." Kwarumba arrived that afternoon with a string of fifty or sixty wretched women, carrying heavy loads of plunder, and some of them with babies in their arms. These women represented as many as forty or fifty villages destroyed and ruined, most of the male inhabitants having been killed, and the rest driven away into the jungle to find what subsistence they could, or die of starvation. All these women were tied together round their waists with thick knotted ropes, and if they lagged on the march, were most unmercifully beaten. Slaves taken from the centre of Africa, like these, do not as a rule, reach the coast; on the contrary, they are taken down to Sekilitu's country, where, owing to several causes, the population is scanty, and slaves are in demand and are sold for ivory, which is afterwards brought to the coast—a caravan usually making a journey towards the centre and then on to Sekilitu's country, and so on alternately.

On our next few day's march we passed near the sources of the Lomâmi, and we also passed several streams running into the Luburi, which is an affluent of the Lualaba. All this country was very beautiful with hills and woods, and marvellously fertile. Here we were beginning to rise out of the broad valley of the Lualaba, and as we came to a height of about 2600 feet above the sea, the oil-palm ceased to flourish.

From this place we went on through Ulûnda, which name Mr. Cooley says means wilds or forests.

After Ulûnda we came into Lovalé, and passed close to the sources of the Lubea and the Zambesi; beyond these we came to enormous plains, which, in the rainy seasons, are covered with water about knee-deep, and this extends across between the affluents of the Congo and the Zambesi. I passed across Dr. Livingstone's route from Sekilitu's to Loanda, and found that the people still remembered him from the fact of his having had a riding-ox.

After the Kwanza we next crossed the Kokema, one of its important affluents, which at that point was some 50 yards wide and about 10 feet deep. The next day we arrived at Komananti, a settlement of Alvey, which was joined on to a native village. Here I was again delayed for a week by Alvey putting off things, and saying that he wanted to get guides, and get this and that. After that, I left there with another man, who was a partner of his, but who behaved much better, and who was to be my guide right on to Benguéla. The first day after we left we marched a long distance, and arrived at a village belonging to Señor Guilhermé Gonsalves, a Portuguese merchant, settled at Bihé, and the next day we arrived at Kagnombe's, the chief of all Bihé. This town was the largest I had seen in Africa, being 4 or 5 miles in circumference, but a large portion of the interior was taken up by pens for pigs and cattle, and tobacco grounds; there were also three gullies in which were sources of streams flowing to the Kokema. I had to present King Antonio (Kagnombe as he called himself), with a gun, and a leopard skin which I had spread out in the hut that was given to me to sleep in. When the secretary, who could not write, called to see me, I was told I must give him something, or else there would be trouble. The next morning I went to see King Antonio; and first of all went into a small outer court, the doors of which were guarded by men wearing red waistcoats with white backs, whom he called his soldiers; some were armed with bows and others with spears, and a few of them with old flint-lock muskets. Next morning I got away and marched over to the house of Señor Gonsalves. Remaining there one night, I marched through an open prairie country, with a few bushes and trees, and intersected by many streams, to the settlement of Joao B. Ferreira.

Just after leaving Ferreira's settlement we passed over a country reminding one very much of the Wiltshire Downs, with large clumps of trees surrounding small villages and in the dips between the different rises streams, some flowing to the Kokema, others into the Kinto and Kutato. Entering the country of Bihé we arrived in Bailunda, the boundary between the two being the Kutato, where we saw an extraordinary sight. A moderate-sized stream came up from the south-east, but where we crossed there was a regular burst of cascades from the hill-sides, supplying at least two-thirds of the water that was running down the main stream. From this place we marched through one of the loveliest countries you can imagine; mountains in all directions of beautiful forms, many of them covered with trees; small knolls, crowned by villages, sheltered by enormous trees having a very European appearance. Passing through this country we had a great deal of rain, and my men began to break down at a place called Humbi; one of them died. The day after, as I was bringing up the rear of the caravan, I found I could not get the men along at all, taking eight or nine hours doing what might have been marched in about three. On arriving in camp, I set to work to think what I could do. I knew that my India-rubber boat was no longer required, I therefore threw it away; also my bed, tent, and every other thing I could possibly get rid of; and picking out about half-a-dozen men who were the strongest of the party, set off to walk the 126 miles that it was to the coast with them, leaving the others to follow more leisurely, and promising to send back assistance. The next day we reached the highest camp in our journey, 5600 feet above the sea, and the mountains were about 400 or 500 feet higher. The following morning we commenced to descend towards the sea, but we had very rough mountainous walking, and several rivers and streams to cross, much of the road lying through passes between steep and rocky hills, on the sides of some of which were clustered small villages that could hardly be distinguished from the rocks, and in the bottoms was a great deal of cultivation. Three days after leaving the main body of the caravan, we arrived at Kisanji. From here to the coast there are no inhabitants, the whole being a desolate tract of mountains, the march lying through passes and over granite rocks. We were a day and a half going through the Supa Pass, which was all rough, hard walking, some parts of it being as difficult as almost any mountain work. Down the bottom of the pass flows a stream, which joins with another that flows into the sea at Katumbela, and which stream is called the Supa, or Pé supa. After leaving the pass we went across a barren plain till we came close to the coast, and then we came upon what appeared sea-cliffs facing the land, as if a continent had sunk in what is now the Atlantic, and Africa had been upheaved afterwards. This was the first limestone formation that I had seen since leaving the East Coast, except a few patches at the south end of the Tanganyika. A large portion of the rocks seemed to be made of chalk, and there were

numerous ammonites and other fossils. During the whole of this march from the main body, which only occupied five and a half days, I was suffering from great pains in my back and legs, and the morning I arrived at Katumbéla a severe attack of scurvy set in, and for three or four days I was neither able to speak nor swallow, but the excitement of getting to the coast kept me up. At 45 miles from the coast we sighted the sea, and our feelings were even more thankful than ο θαλαττα ὁ θαλαττα of Xenophon's 10,000. I was rather puzzled in my course just before reaching the coast, as I had understood that Katumbéla was inshore of Benguéla, and I thought I was going too far north and overrunning my longitude, but I found Katumbéla was on the sea-coast and to the north of Benguéla, and that I was perfectly correct. On arriving at Katumbéla I was received and welcomed in the kindest manner by Monsieur Canchoise, a French merchant, who had received my letter the day before, and was on his way out to meet me.

Most of the country from the Tanganyika to the West Coast is one of almost unspeakable richness. There are metals—iron, copper, silver and gold; coal also is found; vegetable products, palm-oil, cotton, nutmegs, several sorts of pepper and coffee all growing wild. The people cultivate several other oil-producing plants, such as ground-nuts and seni seni. The Arabs, as far as they have come, have introduced rice, wheat, onions, and a few fruit trees, all of which seem to flourish well. The countries of Bihé and Bailunda are sufficiently high above the sea to be admirably adapted for European occupation, and would produce whatever may be grown in the south of Europe. The oranges which Señor Gonsalves had planted at Bihé, where he had been settled for over thirty years, were finer than any I had ever seen in Spain or Italy. He also had roses and grapes growing in luxuriance; but he having been away for three years, many things, such as potatoes and other European garden plants, had been lost, but he assured me that when he had taken care of them they had always come to perfection.

The main point of the discoveries I made I believe to be the connection of the Tanganyika with the Congo system. The Lukuga runs out of the Tanganyika, and there is no place to which it can run but to the Luvwa, which it joins at a short distance below Lake Moero. The levels I have taken prove most conclusively that it can have nothing whatever to do with the Nile; the river at Nyangwé being between 1400 and 1500 feet above the sea, while Gondokoro is over 1600 feet. And also in the dry season the flow of the Lualaba is about 126,000 cubic feet per second; that of the Ganges, which is far larger than the Nile, being not more than 80,000 cubic feet per second in flood-time; and that of the Nile at Gondokoro, below where all the streams unite, is between 40,000 and 50,000 feet per second. Many large rivers flow into the Lualaba below Nyangwe.

There is in the centre of Africa a water-system which might be utilized for commerce, which has no equal upon the face of the globe. Between the large affluents of the Congo and the head-waters of the Zambesi a canal of between 20 and 30 miles across a level, sandy plain would join the two systems, and the River Chambezi, which may be accepted as the head stream of the Congo, ought to be navigable to within 200 miles of the north of Lake Nyassa. To the eastward of Lovalé ivory is marvellously plentiful.

The blot upon this fair country is the continuance of the slave trade, which is carried on to a great extent, to supply those countries which have already had their population depleted by the old coast-trade. The chiefs, like Kasongo and Meta Yafa, are utterly and entirely irresponsible, and would give a man leave, for the present of two or three guns, to go and destroy as many villages, and catch as many people as he could for slaves. The Warua especially, although holders of slaves, would rather die than be slaves themselves. I have heard instances of their being taken even as far as the Island of Zanzibar, and then making their way back, single-handed, to their own country. The only thing that will do away with slavery is opening up Africa to legitimate commerce, and this can be best done by utilizing the magnificent water-systems of the rivers of the interior.

Sir HENRY RAWLINSON, speaking on behalf of the Council of the Royal Geographical Society, rose to express the high opinion which they entertained of the services rendered to geography by Lieutenant Cameron. They considered those services not only important geographically, but equally interesting to the politician, the merchant, and the philanthropist. Although Lieutenant Cameron made rather light of his journey, it was to be borne in mind that it extended over 3000 miles, and that the gallant young officer had been continually, or with very short intervals, on the tramp for two years and eight months, exposed to all vicissitudes of climate and to all kinds of hardship and danger, and yet his courage never gave way. The services he had rendered to geography were very important. He had not been one of those explorers who carried their eyes in their pocket. He had always kept his eyes well about him, and the observations he had made of the country were of extraordinary value. The observations he had taken, and which were now being computed at Greenwich, numbered 5000, and were not only numerous but elaborate and accurate. He had every expectation that the result would be that they would have a definite line laid down from sea to sea, which would serve as a basis for all further exploration of equatorial Africa. Among the minor objects—if he might so call them, where everything was so important—he had to notice Lieutenant Cameron's circumnavigation of the Tanganyika and his discovery of the outlet by which it discharged itself into the Lualaba. Another important matter had been his identification as nearly as possible, though it was not absolutely proved by mathematical demonstration, of the Lualaba with the Congo, and one of his main objects had been to follow the course of the former river, so as to prove or disprove this identity. He had not been able to carry out that scheme in its entirety, but he had collected fresh information to render it a matter, not perhaps of positive certainty, but at all events of the very highest degree of probability, that the two rivers were one and the same. In regard to the political results of the expedition, it was to be noticed that he had discovered a new political power of which they had hitherto known nothing. He referred to the great chief Kasongo, who appeared to be the most powerful potentate in all equatorial Africa, and this discovery was most important in regard to the future of that country, for whatever negotiations were carried on, or whatever measures were adopted for the suppression of the slave trade, would mainly have to be conducted through his instrumentality. He had tracked the atrocious traffic in slaves to its fountain-head, and therefore his services might be said to be not only of great importance to geography, but to philanthropy and civilization. In making these remarks he desired it to be understood that the Council of the Society paid all possible honour to the old pioneers of African discovery; in fact, Lieutenant Cameron was to be regarded not as the rival of Livingstone and the other explorers, but as having enlarged and followed up their discoveries. In conclusion Sir Henry stated that, at the meeting of the Council on the previous day—having weighed the claims of all the most eminent geographers of the time—they had decided unanimously that Lieutenant Cameron was entitled to the first place, and accordingly they had presented him with the principal Gold Medal for the year.

After a few congratulatory remarks from Dr. Badger and Sir Alexander Milne, the Duke of EDINBURGH, in conclusion, moved that a cordial vote of thanks be given to Lieutenant Cameron for his very interesting paper. This proposition was carried amid the heartiest applause, and the meeting then broke up.

80° 82° 84° 86° 88°

34° 32° 30° 28°

H I M A L A Y A

K U M A O N

G A R H W A L

N A R I K H O R S U M

S H A N K O R

H O R

T H O K J A L U N G

D O K T H O L A

T I B E T

N E P A L

I N D I A

Sara

Thok Ting Ring

Thok Thajang

Garchethol

Gargethol

Tinghe Todma

Tingtse madma

Sarthol

Bonsthol

Thachap Kangri

Rawang Lhoma

Rawang Chadma

Chaunsi

Deuchole

Chaunurti

Gartok 19240

Kailas 22026

Misar

Tirthapuri

Gyanima

Rakas Tal

Barkha

Thokchan

Tajang

Dandara 19830

Jashkiang Ch.

Nanda Devi 25660

Nilang

Jadhang

Mana

Kamet 25447

Abi 22516

Api 22586

Nanda Kot 19706

Sarmagar

Kartipras

Alaknanda

Niti

Niala La. 16270

Dhaulagiri 26826

Kali

Gori

Almora 5600

Ramagat

Naini Tal 6409

Lohi Ghat

Haldwan

Bageswar

Rampur 715

Moradabad

Bareli 693

Pilibhit

Shahjahanpur

R. Ganges

Bharaich

Tulsipur

Basti

FAIZABAD

Ghaghra

Gorakhpur 233

Bajjah

Siganli

Parsa

Boragarhi

Chiria

Petauga

Sindulia

Ghat

Megrin

Jalpigur

Brahmaputra

Tsangpo

Raka Tsangpo

Machang Sangpo

Nabrung kaka

Nabrung Kim Cho

Tsaka Rong

Tsaka Tsumbo

SINGATSE

JANGLACHE

Shalia

Thuk

Kamba

Dongi

Gangla

Chalo

Pena (Painam)

Namling

Takhang

Peling

Yarlung Tsangpo

Lhasa

Lhasa R.

Yamdok Tso

Yamdok

Kharo

Karo La

Karo Tso

Karo Chu

Nyenchen Tanglha

Nyenchen Kangsa

Nyenchen Kangsa Chu

Nyenchen Kangsa La

Nyenchen Kangsa Tso

MAP OF A PORTION OF TIBET and ADJOINING COUNTRIES Illustrating THE PUNDIT'S JOURNEY in 1874.

By E. G. Ravenstein. F.R.G.S.

Scale 1: 2.500.000.

0 50 100 Sta. Miles.

Altitudes in English Feet.

86° 88° 90° 92° 34° 32° 30° 28°

Thok Thajang
Yuguk Chaka
Bongye Chaka
Chaindong Chaka
Chang Thang Chaka
Nakchang Gomnak Changma
Nakchang Pontod Changma
Nakchang Pontod Lhoma
Chargut Cho (Buke Nur?)
Road to Nagchu Khar
Nak Chu Kha, Mota Sangpo or Dichu Rapchan
Karche
Raba
Jamáata?
Namru
Sakya
Nakchang Jungmed
Ning
Chokor
Shashyong
Gothap
Chikul Cho
Yakpa Ngochu
Tede Nancha
Lhetod
Nakchang Gomnak
Bul Cho
Taklung
Cherik
Suruk
Jang Namcho Lake (Tengri Nur)
Samdun Kangjang S.P.
Ruchin Gang S.P.
Targot Lhageb
Nakchang Dota
Yakpa Thajang Cho
Hindung
Badam
Lari
Nando
Lachu
Namling
Shigatze
Gnimo
Bhejen
Hoche
Gyamda
KHAM
Snowy Ra.
Lhakpa Thajung
Sang Sang Gialo
Raka Sangpo
Brahmaputra, Naricha Sangpo or Tsangpo
Thuncholing
Nabring Kim Cho
Tashi Kang
Pena (Painam)
LHASA
Chumul
Samaya
Chetang
Hoka
Jacha
Dakpo
Machang Sangpo
JANGLACHE
Pishte
Yamdok Cho
Giantze (Juangdze)
Kamba
Phungtu
Pharuk Berun
Nilam (Kuti)
Gangla
Chalo
Ghasa Mts
Do Jong
Sikung
Chahuil
Udu Mts
Dongkhar
Tashirak
Thlonok Mts
Dankia P.
KATMANDU Bhatgaon
PUNAKHA
TAWANG
Tongsa
Taklung
Lhoba (Daphla)
Tezpur
Brahmaputra
Jalpigur
Megxin
Chatria
Darjiling
Dalimo
Tassiding
Chumbi
Phari
Gyala Sindong
Chelham
Dewangiri
Odalguri
Bijni
Mangaldai
NEPAUL
SIKKIM
BHOTAN
ASSAM
BENGAL